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THE BIOLOGY OF THE TYRANNIDÆ WITH RESPECT TO THEIR SYSTEMATIC ARRANGEMENT.

BY DR. H. VON IHERING.

THE systematic arrangement of animals is usually based on morphological characters only, but biological observations may often give us precious hints which may help us to settle difficult questions in this respect. Considering that the present systematic arrangement of the genera belonging to the great family of Tyrannidæ is far from being a satisfactory one, I have thought it useful to study in a comparative way the biology of the members of this family.

Of the four subfamilies accepted according to the classification of Mr. Sclater, at least one seems to be unnatural as well as regards morphological as biological characters; that is to say, the Platyrhynchinæ.

In my paper on eggs and nests of Brazilian birds (Revista do Museu Paulista, IV, 1899, p. 226) I described the nest and eggs of *Platyrhynchus mystaceus* and expressed my surprise at their great difference when compared with the nests and eggs of the allied genera. Having obtained this year an authentic nest of this species I am able to state that as regards the first described nest there was a mistake. The nest of the above mentioned species of *Platyrhynchus*, which will be fully described in Vol. V of the

'Revista do Museu Paulista,' is purse-shaped and suspended at the extremity of a branch. It has a round opening in the middle protected by a shelter above. I have quite similar nests of *Todirostrum cinereum*, *Orchilus auricularis*, *Hemitriccus diops*, and of different species of *Euscarthmus*. The same form of nest is, therefore, common to the genera *Platyrhynchus*, *Todirostrum*, *Euscarthmus* and *Orchilus*. Moreover, the eggs of the members of all these genera are yellowish white or brownish with very fine points on the larger end.

On the other hand the nests of *Serphophaga* are placed among the diverging boughs of a branch and are cup-shaped, while the eggs are of a uniform yellowish white. Of the same type are the nests and eggs of *Anæretes* and *Hapalocercus*. The nest of *Phylloscartes ventralis*, however, as Mr. Krone assured me, has one wall of the nest elongated above and recurved, forming a somewhat globular, domed structure.

A form of nest like that of *Serphophaga* is found in the genera *Elainea* and *Phyllomyias*, and in other Elaineinæ, among which, however, occurs also a second form of nest. This form is illustrated by the nest of *Ornithion obsoletum* which I have recently examined. It is of a pear-shaped form, similar to that of *Euscarthmus*, but not suspended from the top of a twig but fixed at different points on the branches.

Euler has described the nest of this species differently, but the nest observed by him, which was much hidden between masses of Tillandsia, was not probably of a normal form. Besides, *O. obsoletum* does not occur in Rio de Janeiro and Bahia, where the species is represented by *O. cinerascens* (Wied), which, in opposition to Mr. Allen, I do not doubt is identical with *O. imberbe* Scl. A similar nest is built by *Mionectes rufiventris* (Licht.), as has been observed by Mr. Krone.

The nest of *Ornithion* forms the transition between that of *Serphophaga* and that of *Euscarthmus*. We may be justified to assume that such an artificial and wonderful construction as the nest of *Euscarthmus* is not the work of free invention but is to be considered as the result of development from a previous form of nest. We have but to suppose the nest of *Ornithion*, instead of being fixed on various branches successively, to be placed on one

branch only and we have the suspended nest of *Euscarthmus*. A very remarkable form of suspended nest among the Tyrannidæ occurs in the genus *Rhynchocyclus*, but I believe it to be nothing more than an extreme modification of the Euscarthmine nest type. In this respect it is remarkable that the much bristled and flattened bill of *Rhynchocyclus* is very like that of *Platyrhynchus*, and quite different from that of the typical *Elaineæ*.

Although the predominant form of nest among the Tyrannidæ is certainly the cup-shaped one, we meet also with very different structures in this family. Covered nests occur in the genera *Phylloscartes*, *Arundinicola*, *Pitangus*, and *Myiozetetes*, leading us on to the nest of *Ornithion* above described, and to the suspended nests of *Euscarthmus* and *Rhynchocyclus*. According to Euler *Myiobius barbatus* has a suspended, purse-shaped nest, while the nest of *Myiobius nævius* is cup-shaped, but is fixed suspended within the fork of two diverging branches in the manner typical of the nests of *Thamnophilus* and other Formicariidæ. On the other hand we find nests of very slight structure made of a small number of slender sticks and roots in the genera *Tyrannus*, *Empidonomus*, *Myiodynastes*, *Megarhynchus*, and others. These nests are extremely flat and apparently not well suited to retain the eggs in safety.

Among the Tæniopterinæ, inhabitants of the open plains, there are species which breed in holes in banks, as is said to be the case in Argentina with *Tænioptera nengeta* by Mr. Hudson, while in Brazil this species builds its nest on trees. The species of *Copurus* and *Machetornis* breed in holes of trees, as also does *Tænioptera irupero*. The last-named species likes to appropriate the large covered mud-nests of *Furnarius*, and *Machetornis* prefers the large thorny nests of *Anumbius*. Thus we see among the Tyrannidæ the most different forms of nest structures represented.

In general the nests of species that inhabit the woods are well built, and covered carefully with dry plant material in order to be well hidden. Some of them, such as that of *Elainea*, are true masterpieces of art, being generally ornamented externally with pieces of lichen carefully fixed on by spiders' webs. On the other hand, the Tæniopterinæ and Tyrannidæ, inhabitants of the pampas and campos, contrary to what would be expected, take little

care to hide their nests. Everyone would suppose that these birds should prefer to build their nests under cover of the grass and form simple structures of dried grass, as do the species of *Sycalis*, *Ammodromus*, *Embernagra*, *Emberizoides* and other Fringillidæ of the campos. Except, however, in the genus *Alectrurus*, I do not know any other example among the Tyrannidæ of this form of nesting. In general these birds are not very careful to hide their nests. On the contrary the large species of Tyranninæ, and the species of the allied genera *Myiozetetes* and *Pitangus*, seem to prefer to place their nests on isolated trees, as much exposed as possible. This custom corresponds well with the bold characters of these birds.

Taking a general view of the *eggs* of Tyrannidæ, we find a uniformity in coloration which is in strong contrast to the variety of forms of their nests. The eggs in this family, as a rule, are white or cream-white with reddish brown spots at the larger end. These spots are small and pointed in the Euscarthminæ, while they are obsolete in the buff eggs of the Serphophaginæ. The occurrence of pure white eggs is limited to the genera *Copurus*, *Arundinicola*, and a few others. In the genus *Muscivora* the ground color is somewhat dark brownish. The eggs of the genus *Myiarchus* are remarkable for the elongated form of the numerous red-brown spots.

If we compare the color of the eggs with the mode of construction of the nests no pronounced correlation is to be found. Uniformly white or cream-colored eggs exist in the genera *Copurus* and *Arundinicola*, which are deposited in covered nests, while the similar eggs of the Serphophaginæ are laid in open nests. The eggs of the Euscarthminæ, though deposited in closed nests are adorned with numerous red spots, while those of *Myiozetetes* and *Pitangus*, which are laid in closed and domed-shaped nests, have the same large, reddish brown spots as those of the genera *Tyrannus*, *Milvulus*, and others, the nests of which are wholly open. Similar cases prevail in the eggs of other South American birds. In this respect the example of the American Gallinæ is instructive, for while as regards the careless construction of the nest no difference is noticeable, the eggs of the Brazilian representatives of the Gallinæ are white, while those of the Crypturi are distin-

guished by the most brilliant colors of brown, red, blue, and green. It is true that the Pici, Psittaci, and other birds that lay their eggs in hollow trees, all have white eggs, but eggs of the same color are found also in the open nests of the Trochilidæ and of the Columbæ. Returning to the Tyrannidæ we find the egg of *Machetornis rixosa* wholly different from those of the true Tæniopterinæ, and resembling in its numerous, large, somewhat elongated brownish spots the eggs of the genera *Empidonomus* and *Myiarchus*, especially those of the latter. These facts throw doubt on the correctness of the generally accepted systematic position of *Machetornis*. So far as regards the egg of *Tyrannus aurantioatronotatus* Lafr. & D'Orb., it belongs to the genus *Tyrannus* and not to *Empidonomus*.

These differences, therefore, cannot be explained by the so-called law of 'natural selection,' but bear relations to the genetic affinities and the inner movements which, independently of the supposed 'natural selection,' determined the individual variation as well as the phylogenetic development of the organisms.

After what I have stated it is evident that the systematic arrangement of the Tyrannidæ in its present form can only be considered as provisional, and it may be well altered when a general anatomical study of the whole group has been made. At present the systematic sections are only based on a restricted number of external characters, principally on the form of the tarsi, feet and bills. These characters are in intimate connection with the manner of life. In this way we are exposed to the danger of confounding essential typical characters with adaptive ones. I think that such a mistake took place on the occasion of the formation of the subfamily Tæniopterinæ. This section embraces forms with strong feet, strong and elongated tarsi, and slender elongated bills, characters which seem to result from the life on the ground on the pampas and campos, which these birds inhabit.

In general this subfamily may be considered a very natural one. The predominant colors of the species are gray, white, and black. These colors are not common in the family Tyrannidæ as a whole, and they are evidently to be considered as being acquired characters and not of a phylogenetic value. This is proved by

the fact that in the species of *Cnipolegus*, *Lichenops*, and others in which the males are wholly black, the females and young are of a brownish color or have a spotted plumage. Among the more or less similar members usually placed in this subfamily two monotypic genera are completely different in their coloration, namely, *Sisopygis* and *Machetornis*, which in my opinion do not belong to this subfamily, but to the Elaineinæ. *Machetornis* seems to me to be allied to *Pitangus*, and *Sisopygis* to *Mionectes*, *Capsiempis*, and similar genera. While *Machetornis*, at least in its mode of life, resembles the Tæniopterinæ, *Sisopygis* inhabits the woods like the Elaineinæ.

That the Platyrhynchinæ really consist of two different subfamilies, Euscarthminæ and Serphophaginæ, we have shown above. With the biological differences correspond such important morphological ones, principally those of the form of the bill, that the separation here proposed will probably be accepted as being naturally founded.

In order to obtain a natural classification of the Tyrannidæ it is necessary to get an idea of the phylogenetic development of the family. In this respect the Tyranninæ, judging from their large dimensions and their large, somewhat depressed bills, do not represent the original form, but, as I think, an extreme branch of the family. Other specialized branches are found in the Euscarthminæ and Tæniopterinæ. The latter offer not only a coloring somewhat uncommon in this family, but also cases of decided sexual dimorphism, which evidently represents a specialization acquired within the subfamily.

Excluding from the Elaineinæ the Pitanginæ — large birds with strong bills that biologically much approximate to true Tyranninæ — the Elaineinæ evidently represent the group most nearly allied to the ancestors of the Tyrannidæ. These forms are also those which have the nearest relations with the Pipridæ. Strongly developed syndactylism, which is one of the characters distinguishing the latter, is also very remarkable in many genera of the Elaineinæ, as for example in the genus *Tyranniscus*.

Among the Pipridæ the same fact is observable as in the Tyrannidæ, namely, that sexual dimorphism in coloration exists only in the more highly organized forms. In the subfamily of Piprinæ

the very striking and beautiful coloration is found only in the adult males, while the females and young males retain uniform olive colors, and it is also only among the adult males that we meet with such abnormal characters as enlarged stems of the primaries and secondaries, erect frontal feathers, and elongated tail-feathers, while the Ptilochlorinæ resemble the Elaineinæ not only in coloration, but also in the rather small and bristled bill. These facts induce us to conclude that the Pipridæ and Tyrannidæ have descended from a common ancestral form, the nearest relatives of which are the Elaineinæ among the Tyrannidæ with the Ptilochlorinæ among the Pipridæ. The common ancestors must have been birds of small size, with pronounced syndactylism of the outer toes, with rather small, somewhat compressed and bristled bill, and of uniform olive color. The frequent occurrence of a yellow coronal patch among the Pipridæ as well as the Tyrannidæ leads us to suppose that this ornament may have been transferred from the common ancestors, which were inhabitants of the woods. From the Elaineine branch of the Tyrannidæ originated, besides the Euscarthminæ and Serphophaginæ, whose biological conditions are nearly the same, two great sections of inhabitants of the campos, mostly large-sized birds, the Tæniopterinæ and the Pitangine-Tyranninæ.

With these general results the geographical distribution accords. As is generally the case with the wood-inhabiting birds, the distribution of the Elaineinæ of Brazil is a somewhat restricted one. While a number of species are distributed through the forest region of Brasil, only a few range through Guiana and Central America to Mexico. The Euscarthminæ in this respect also do not diverge much from the Elaineinæ, but the Serphophaginae, preferring open plains and river banks, do occur not only in the campos but the majority of them is restricted to the Andine Region. These two groups of campos inhabiting Tyrannidæ are wholly different not only in their way of life but also in their geographical distribution.

The habits of the Tæniopterinæ are terrestrial. They run on the ground and have in relation therewith elongated tarsi and strong ambulatorial feet, seeking their insect food on the ground. They inhabit the pampas and the campos of central Brazil, being

represented in the littoral zone by but few species. On the other hand, many species and genera are adapted to live in the Andes, where they occur from Patagonia to Colombia, but no species of these Andine forms passes into Mexico and Texas. For this reason I think it to be right to separate the genus *Sayornis* from the Tæniopterinæ, and to unite it to the Tyranninæ, in the society of which it is found in North America and from which it does not differ regarding its biology.

The Pitanginæ and Tyranninæ, on the contrary, are of very wide geographical distribution. Though preferring the campos, they avoid the treeless plains. They are not ground-walkers, but capture insects as they fly like Flycatchers. They are very active, courageous birds of large size and good flight, and their geographical distribution therefore, as a rule, is very wide, some of them occurring from Argentina to North America. Among the seventy-eight species of Tyrannidæ living in the State of S. Paulo forty-three belong to the Elaineinæ and the allied groups of arboreal life, and of these ten, or 23 per cent, have a relatively wide geographical distribution. Among the six Pitanginæ only the two species of *Conopias* and *Sirystes* are restricted to Brazil, while the species of *Legatus*, *Myiozetetes*, *Pitangus*, and *Myiodynastes* are represented even in the southern parts of North America by the same species or by little different local races. Among the sixteen Tyranninæ of S. Paulo all have a very extensive geographical distribution except *Blacicus cinereus* (Spix) and *Tyrannus albogularis* Burm., so that more than 80 per cent of the Pitanginæ and Tyranninæ of S. Paulo have very wide geographical distribution.

These facts of geographical distribution show us that the only system of nomemclature well applicable to the discussion of zoögeographical problems is the trinomial.

The use of binomials as employed in the excellent Hand-list of Dr. Bowdler Sharpe may be more advantageous for collection purposes, but it combines in a very inconvenient manner well-defined species with local races. Such facts as the vast distribution of *Pitangus sulphuratus* (L.) and *Myiozetetes similis* (Spix) are completely hidden by the use of binomial nomenclature.

It is also among these birds that we meet true migratory forms,

so far as such exist among the Tyrannidæ. This fact is in intimate relation with the special biological conditions of the campos. No migratory birds at all exist among the wood-inhabiting Tyrannidæ, nor among the Pipridæ, Formicariidæ and other families of the forests.

True migratory birds are scarcely represented in South America and are essentially restricted to two families of insectivorous birds, the Hirundinidæ and the Tyrannidæ. In South Brazil, from Rio Grande to S. Paulo, I have observed migratory habits in the following species:—

Myiodynastes solitarius (Vieill.). *Tyrannus melancholicus* Vieill.
Pyrocephalus rubineus (Bodd.). *Muscivora tyrannus* (L.).

As I am preparing a paper on this subject to be published in 'Aquila' I will not discuss it in the present paper. It is evident, however, from the preceding deductions, that in biological respects the family of Tyrannidæ is one of the most interesting of the Neotropical Avifauna, strongly contrasting with the uniformity which in this regard prevails in most of the other characteristic families.

Although the object of this essay was only to refer to some general biological features and habits common to certain subfamilies I nevertheless think it useful to give briefly the results of my observations, as they may be of service to a subsequent worker who will undertake the necessary systematic revision of the family Tyrannidæ. They are as follows:

(1) The Tæniopterinæ represent a very natural systematic group but as usually arranged include some strange elements, such as *Sayornis*, *Sisopygis*, and probably *Machetornis*, which should be removed to other subfamilies.

(2) The Platyrhynchinæ of the systematic arrangement of Mr. Sclater contain two quite different sections, the Euscarthminæ and the Serphophaginæ.

(3) The Elaineinæ contain some aberrant forms which should be removed to other subfamilies. For example, the genus *Rhynchocyclus* should go to the Euscarthminæ, and the genera *Legatus*, *Myiozetetes*, *Conopias*, *Pitangus*, *Sirystes* and *Myiodynastes* should form a subfamily, Pitanginæ, a section which biologically is inti-

mately related to the Tyranninæ, while morphologically it is intermediate between the latter and the Elaineinæ.

(4) The Tyranninæ form a natural section with which perhaps the Pitanginæ should be united.

S. Paulo, Brazil, 9 Nov., 1903.

A DISCUSSION OF THE ORIGIN OF MIGRATION.

BY P. A. TAVERNER.

ONE of the first, if not the very first, phenomena of animate nature to be noticed by primeval man, must have been that of migration; and from that day to this it has been, to a greater or less extent, a subject of great interest to students. In the present day it has been approached from many different sides, and though many points have been pretty well cleared up, others are still enveloped in a haze through which the fundamental principles are but barely visible, while others still remain shrouded in a dense, impenetrable cloud of mystery.

The methods by which birds find their way to far distant points, the manner of their migrations, etc., lie without the scope of this paper, and will not be referred to here. Upon these points we all await the publication of the results of the investigations now in progress, when probably many obscure points will be cleared up.

Migration consists of two movements, one in the spring, away from the winter station; and the other in the fall, towards it again. The reason of the latter is self-evident. There is a lack of food. If they did not return in the fall they would perish of hunger, if not of cold. From general observations, it seems as if the former had a larger influence than the latter, and it is the northward movement that needs explanation. Why should a bird leave a warm land of plenty to journey to a country but half recovered from the frozen embraces of an arctic climate? It seems

improbable that the birds themselves realize why they migrate, or what benefits are to be thus gained or enemies escaped. When the proper season comes, "the spirit moves them," and they go or come, as the case may be. However instinctive their habit may now be, there must have been a time when migrations were intelligent movements, intended to escape some danger or secure some advantage; and through generations of repetition they have become fixed into hereditary habits, closely with reproduction and reproductive seasons. In time the two habits became so interdependent that the awakening of the sexual desires sympathetically affected the migratory instincts and caused restlessness and a desire that was only to be satisfied by the accomplishment of the same long journey that their progenitors had taken for generations.

Of the many theories that have been advanced to explain this question, I will mention a few that seem the most important and the most generally received. While advancing nothing absolutely new, I wish to call attention to one factor in the question that has not, in my estimation, been given its due importance, nor has it been recognized, as far as I am aware, that therein lie possibilities probably capable of producing all the phenomena of migrations as we now see them. Of this, more anon.

There is a theory extant, supported by W. K. Brooks in his 'Foundations of Zoölogy' that has received a considerable amount of attention. This ascribes migration to a desire to find nesting sites secure from arboreal Mammalia and Reptilia. This supposes, and perhaps correctly so, that the northern nesting stations are safer from these enemies than the tropical ones; though any one familiar with our northern woods, and acquainted with our ubiquitous red squirrel, may have good grounds for doubting the general statement, as far as it relates to mammals, at least.

There are certain facts of distribution, however, that this theory fails to explain, and which seem, indeed, to be in direct antagonism to it. Typical instances of this can be seen in the distribution and ranges of the families of Cuckoos and Doves. Also the occurrence of such an elaborate and careful nest builder as the Baltimore Oriole, as far north as the Transition fauna. Surely,

such a nest as this bird builds would be as secure from these enemies in the heart of the tropical forests as in the temperate ones. Therefore, safe nesting sites could not be the object of their migrating,— unless the peculiar form of nest was evolved after the migratory habit had been formed. This, however, does not seem to have been the case. Such a likeness is exhibited in the forms of the nests throughout the whole family, that we are forced to conclude that this type of nest was used by the common ancestor of *Icterus*, which must have been before the Baltimore Oriole became migratory.

The cuckoos and doves above mentioned, are notoriously careless nesters, and under this hypothesis, we would expect that migration would have been forced upon the whole of these families, or at least upon a considerable number of the species composing them. Contrary to this, we find that these are peculiarly tropical and subtropical families, and but a very small percentage of them ever get up into northern latitudes.

It may be held that the above cases are exceptions, caused by varying local conditions, but it still remains to be proved that the generality of tropical nesters take any greater nesting precautions than northern ones of the same class, as would assuredly be the case if the above were the correct solution of the problem. Furthermore, there are grave reasons, to which I will refer later, for doubting that inadequate nesting habits could ever be the cause of migrations.

A second theory, advanced under the auspices of Mr. Chas. Dixon, refers the movement to a natural desire of the individuals of a species to disperse during the breeding season, and draws attention to the fact that the bird population is more scattered during the breeding season than at other times. He utterly refutes the idea that adverse circumstances of either food, temperature, or enemies can force a bird to change its range, and cites instances of the Great Auk, Labrador Duck, and other species that have suffered extermination rather than forsake their accustomed habitat. Mr. Dixon evidently regards this dispersal as effecting a reduction in the density of the population. It certainly does result in this among the adult inhabitants, but it is open to question if we assume that the total population is

thus affected. His conclusion is apparently based upon the well known and indisputable fact that birds are harder to find during the breeding season than at other times. It must, however, be remembered that for each pair of breeding birds observed, there is somewhere about a nest full of young that are not seen at all. These young are of as much economic importance in reckoning population as the adults, and as such must be taken into consideration. On the whole, I doubt very much whether the bird population in the breeding season is any less per given unit of territory than at other times.

That migration is caused by a natural dispersal of the adults during the breeding season must be admitted. But this is begging the question. Migration is a dispersal; and conversely, this dispersal, as it manifests itself, is migration. The author fails to explain the cause of the natural dispersal. The object of this scattering may be seclusion, either for privacy or safety. If for privacy, it seems to defeat its own ends when such birds as the herons, swallows, and like gregarious nesters congregate in great communities to perform their marital duties. If safety is sought, it presupposes that all the safe nesting sites are monopolized by other species and the migrants are crowded out.

In our own country, we can readily see that but an infinitesimal fraction of possible sites are thus occupied. How rare it is for a nesting place to be used a second time by different individuals,— except in the case of woodpeckers' holes, where it is obvious that the supply is limited,— any field worker knows. If desirable forked branches, etc., were at such a high premium, this would occur frequently. If, then, the above is true in our own country, how much more must it be true in the tropical stations, where, though the population of both birds and their enemies is greatly increased, the luxuriant vegetation affords an infinitely greater number of desirable sites for nesting. Crowding in this sense seems impossible.

That individual birds cannot be driven from what they regard as their proper stations, may possibly be admitted; but that species cannot (when the adverse changes in surroundings take place gradually enough), is absurd. As far as I am aware, there are three principal ways by which geographical distribution can be

effected. One is the sudden irruption of a species, when it suddenly appears in numbers in a territory where it had been either extremely rare, or entirely absent. Examples of this are to be seen in the sudden occurrence of the Sand Grouse in Europe in 1888; the appearance of great flocks of Brünnich's Murre on Lakes Ontario and Erie, 1894–97, and the great movements occasionally noted in Lemmings. Of the underlying causes of these strange migrations, whether they are due to inner psychological or outer physical phenomena, we are ignorant. These strange overflows seem so erratic and abnormal in the light that invasions of this kind do not succeed in forming permanent settlements on the new grounds, that it would be reckless at present, to use them as a basis for theorizing, until all other means fail.

The second method is by a force exerted from within an established range; and the third, an attractive one acting from without. These two, however antagonistic as they may superficially seem, are, at root, one and the same. They are both caused by differences in the desirability of two stations. One is caused by a decrease in the desirability of a present, and the other by an increase of the same quality in an adjoining territory. They are but ratios of desirability, and can both be expressed by fractions whose values depend upon the relative, not the numerical size of their terms. If, then, attraction is but a phase of driving, and birds cannot be driven from their haunts, we are forced to discard all our present theories of geographical distribution and return to that of special creation, or found our science upon the unknown quantities of general irruption probably caused by psychological disturbances of whose origin and intent we are ignorant.

Ranges can be, have been, and in the course of time, must many times have been, changed by necessity when the changes in conditions occur slowly enough so that, though individuals may not, the whole species might have advanced or retreated. In this same manner, we know that even our forests have migrated back and forth across the continent before the face of the glacial ice, climbed mountains and descended valleys, though each individual tree or plant remained rooted for life to the spot where it originally sprouted. If plants can and have done this, I see no reason why birds could not also, as even in the most extreme case of local

attachment, a bird can never be as firmly fixed to its station as trees and plants are to theirs.

The cases of extermination cited are where the changes had come too suddenly, or where the species had become stereotyped or inflexible in habits and structure by too long and great success under peculiar conditions, and so lacked the elasticity of nature necessary to modify itself and its life to slight changes of environment.

A. R. Wallace has outlined another idea on the subject. He suggests, in 'Island Life,' that the migrants are in search of soft-bodied insects suitable for nestlings; that, as the season advances in the tropics, it becomes dryer and dryer, and such insects soon disappear. According to this view, it seems at first sight to be a seeking after food of a certain quality. Reduced to its lowest terms however, it appears as a very different matter, namely, a question of quantity. It is admitted that, even in the tropics, there is at least a short season when there are insects of a suitable quality for nestlings. That this season is long enough to raise birds, is evident, for many species closely related to our migrants successfully nest and raise their broods there. If all birds bred there at this same period, there would be suitable food there and migrations would be unnecessary. That they do not, is an indication that some other factor enters into the question, and it seems very probable that all birds breeding contemporaneously would exhaust the supply of such food. The question, then, is one of quantity more than quality.

It may be objected that each species requires its own special food at the critical nesting period, which may not be obtainable everywhere. Now, if there is any truth in our present evolutionary theory, great changes in food habits have occurred in all our species. But the new food supply must, in each and every case, have occurred before the habits and structure for utilizing it appeared. Therefore, food habits could never have originated migrations, though migration undoubtedly has had a great influence in modifying food habits.

It must be remembered also, that migration is a dangerous undertaking to a race. A journey covering thousands of miles, to be performed against innumerable enemies, both personal and

elementary, into a country just recovering from the rigors of winter, is a very hazardous solution of any problem. Especially must this have been true in the early days of the habit, when the races were much less adequately provided with hereditary experience and structure necessary for its successful conclusion. In this light, it seems highly improbable that anything short of the sternest necessity would favor the development of a habit so fraught with danger to the individuals of a species; and that, if any less hazardous solution were possible, it would have been taken advantage of.

The great diversity of food and nesting habits exhibited by closely allied species, shows how easily, comparatively speaking, these habits are modified. Therefore, if any peculiar nesting or food requirements menaced the welfare of tropical residents to the extent that must have been necessary to produce migration, it is reasonable to suppose these habits would have been altered to suit surroundings long before such a dangerous habit as migration could have been adopted.

The natural inference is that the problem was something that could be solved in no less hazardous way. For it would be much easier for birds to learn to build woven pensile nests at the end of long slender branches, or to adopt food that closely allied species found acceptable, than to create all the elaborate instincts, powers and structures necessary to enable them to traverse great stretches of country unguided, and in the face of meteorological disturbances, new enemies, strange foods, and all the dangers attendant upon migration. These grounds, then, alone seem sufficient to discredit any such phenomena as the foregoing, as prime causes in the origination of this habit.

The one cause that seems adequate to produce such great results, is that one which ultimately rules the whole animate world —the sufficiency of the food supply. Admitting that in the tropics there is, at any time, or more especially during the migration seasons, a lack of, or a severe struggle for food, and we have a necessity sufficiently imperative to cause the origin of any habit that it is possible to form. Mr. J. A. Allen, and others, have shown that the usual struggle for existence, always and everywhere intensely severe, is sufficient to cause an overflow into an

adjoining area whenever that area assumes conditions favorable for the support of an increased population. The return of spring causes the favorable conditions in the north, and the spring migration is the evidence of the overflow. The approach of winter influences life in the same manner, but the overflow, or migration is in the opposite direction.

Mr. Allen has very aptly applied the saying that "Nature abhors a vacuum," and suggests that migration is the only manner in which a zoölogical vacuum, in a country whose life-supporting capacity is a regularly fluctuating quantity, can be filled by non-hibernating animals.

That this view is correct, I do not think can be doubted, but there is another factor in the case that does not seem to have been generally perceived,—a fact that strengthens the foregoing reasoning manifold. True, Mr. Newton, in his 'Dictionary of Birds' has suggested it, but without apparently perceiving what a powerful factor it must prove in the case. I refer to the effect of the large increase of life in the breeding season, in an already thickly populated country, such as the southern stations must be just previous to the spring migration, coincident with the opening up for settlement of a vast adjoining and practically unoccupied territory, by the seasonal recession of the winter ice cap. Under the "Law of Malthus" we find a country to the south of us, populated to its fullest extent during the winter. Spring comes, and nearly every pair of birds has a nest full of young, requiring great quantities of food. The food demand must be increased to many times what it was before. There would, of course, be an increase in this food supply, due to the influence of spring, but it would not be in proportion to the demand. This inadequacy of the food supply is brought home to us very clearly if we reflect upon the fact that it takes the whole northern hemisphere to support the species in the summer that all through the winter were confined to a very limited territory; and that even then, during the time of greatest dispersal and food supply, the competition is always keen. Considering, then, that this great increase in population happens contemporaneously with an equal growth of the food producing territory due to the return of spring, it does not seem at all wonderful that the birds should migrate to utilize a

plentiful food supply and escape death by the causes attendant upon the evils of insufficient nourishment.

Migration, if the outcome of these phenomena, probably would have originated in the following manner. In the beginning of the breeding season, the competition would originate in the areas containing the earliest breeders, and would be severest in the most productive districts. Here the strongest species would soon drive out the weaker ones and the later breeders, which, having no parental ties to bind them to any one locality, would be more easily forced to leave than those already possessing nests — all other things, of course, being equal. These species, driven away, would encroach on others, forcing them out, in their turn, to trespass upon a wider circle of species. Thus the pressure arising from the congestion originating probably in the center of the winter residential area, would be felt to the farthest points of the populated territory. Any stringency of food supply invariably causes greater exertions on the part of the inhabitants, and hence wider ranging; and the slightest increase in sustaining power of adjoining lands would be immediately found and taken advantage of. As these species moved into the new country, their places would be quickly taken by those behind, and as the congestion was relieved, the impelling force would be constantly reinforced by the nesting of the later breeders as the season progressed.

The increase of population and life-supporting area would proceed regularly and evenly, so that the pressure would never exceed the relief. This nice balance would, of course, have been secured according to the laws of survival of the fittest — undesirable forms that would disturb the equilibrium, being either modified or eliminated.

Thus each species, crowded on by those behind, and enticed by the advance of those in front, would proceed onward until their own particular station had been reached. This point would be determined by one or more of several factors. The most obvious of these would be the failure of their particular food, the arrival of their nesting season, and the absence of superior competitors. When a species had reached this stage in its own particular migration, it would settle down and nest, and from then, to the end of its nidification period, would be fixed, and by its own increase

aid in driving forward those that had not yet found suitable conditions for nesting.

In the incipiency of the migration habit, the individual movements would be small, perhaps originating in a pair of birds discovering an unexpected store of food on the side of a hill opposite their usual haunts. The birds that were bred here would find their way back the next year with greater ease than their parents did originally, and would be in a position to make further advances to the hill beyond. So each year, as the glacial ice receded, the territory suited for summer occupancy would be slightly enlarged, and the birds would each succeeding year, during the period of greatest stress, find sustenance a little to the northward of the preceding season's uttermost range.

The migratory movements and the differentiations of the breeding season are so closely connected that it is difficult to determine which originated first. Migration would delay breeding in the species that showed the slightest inclination towards the habit; and conversely, a delayed breeding season would actively assist the evolution of migration. The origination of both may have been simultaneous, though it is hard to imagine a time when some slight traces of migration would not have been beneficial to the races. At any rate, their effects would have been cumulative, each increasing and fixing the others. Once started, then, either or both would be rendered more and more pronounced, through natural selection, until the extreme limit profitable for each species was reached.

The gradual extension of the extreme summer range, as the glacial ice cap retreated, would most probably have been by means of the younger individuals, or birds in their first breeding season, of each species, as these would be weaker, and more easily driven than the older ones that would have become more attached to their local habitats. It seems universally true that young birds do not often return to breed in the immediate vicinity of the place where they are raised. There is a dispersing influence of some sort at work here. It is said that the older ones drive their offspring away from their hunting grounds when those offspring are able to take care of themselves. I cannot say from actual experience that they do this, but it seems so advantageous a

habit that its development is not only possible but very probable, and just what the student of evolution would expect.

This scattering of the younger individuals, however it was brought about, would then favor the extension of the migration range by the ones thus driven to wander from their accustomed haunts. As further substantiation of this, it is to be noticed that birds found far from their natural haunts are usually immature specimens.

A young bird on its first spring migration, would naturally return to the familiar place where it was raised. Being driven away from here, it would wander about until it found a suitable location for its own breeding — perhaps a mile, perhaps two, maybe less, away from its original home. The succeeding years, it would return to this new haunt, and the range of the species could be extended by its offspring. Thus, each bird would follow the route taken by its parents, and thus each point on a migration route would indicate the place that was once the ultimate goal of the migrations of its ancestors.

Migrations to true oceanic islands are more difficult to explain along these lines, but I do not think that they invalidate the reasoning in any way. Migrating birds certainly have wonderful, and as yet mysterious, senses of location and direction, and it is not too much to say that a bird, once it has traveled a certain journey, is usually able to find its way over the same path again. A pair of birds have only to be storm-blown to one of these isolated spots, breed there, and return with its progeny, to start a tendency in their offspring to migrate to the same place again. As long as the least tendency to an advantageous migration were started, natural selection would confirm, increase, and fix the habit firmly; and along with this, the new senses, structures and habits necessary to their accomplishment. It is unlikely, however, that this type of migration could be started until after certain powers and senses had been developed by migrations to other localities. They must, therefore, be regarded as secondary movements originally, though in some cases they have become now the prime or only migrations of the species by the extermination of all those individuals that adhered to the original routes.

The return movement in the fall is the same thing, nearly, as

the spring migration, but reversed. The shortage in food, however, is not caused, except indirectly, when the first migrants encroach upon those below them, by the increase of population, but by the direct failure of the food supply. It is perfectly evident that certain species must return south again, or stay and surely starve. The total population, however, of any area, cannot permanently remain greater than the number that can be sustained through the season of least food supply. During the height of the breeding season, there are many more birds than can be carried through the winter in the restricted southern stations, and if they are to return there again, the excess must be got rid of. Many of them are killed off at a very tender age — probably the great majority of them fail to survive the fledgling stage. Many more, young and inexperienced, must perish when first they leave the protecting influence of the parent's care. Others are battered about by the storms and destroyed by the perils incident to the fall migration. The few surplus that remain are subjected to a stricter and stricter process of selection as they reach more congested areas; and, in the end, the total population fits into its place in the winter quarters, to the extreme limit of the supporting powers of the land.

These migrations, in their earliest stages, must then have originated in a conscious seeking for food — not special food, but any food that would support them. Accidental wanderings taught them where to find it, and experience suggested their return there on the first approach of a stringency in the food supplies. In course of time, the movement became habitual, and generations of repetition rendered it instinctive. Instinct, having the same relation to judgment as automatic machinery has to ordinary mechanism, would be favored through natural selection; and as the birds acquired the peculiar powers necessary, migrations assumed all the varied phenomena that they exhibit to-day.

EXTRACTS FROM AN UNPUBLISHED JOURNAL OF JOHN JAMES AUDUBON.

BY RUTHVEN DEANE.

THE Journal from which these extracts are taken, covers the period from October 12, 1820, to December 30, 1821. This would have been included in 'Audubon and his Journals' but unfortunately it did not fall into the hands of the author until more than a year after this work had been completed and published. I am under many obligations to Miss M. R. Audubon for the privilege of publishing fourteen days of this diary, covering dates between October 12, 1820, and November 25, 1821. As there is now but little unpublished Audubboniana, excepting family letters, this portion of the Journal is of peculiar interest. It shows that period of the great naturalist's life, eleven years before the publication of the first volume of his 'Ornithological Biography,' when, without money and living where his talents were not appreciated, he was making a fight in which few could have conquered under similar conditions. To fully appreciate the 'Birds of America' one must read the early life of the author.

FROM AUDUBON'S JOURNAL.

Oct. 12th, 1820 (*On the Ohio*). Shot an Autumnal Warbler[1] as Mr. A. Wilson is pleased to designate the young of the Yellow rumped Warbler; this was a young male in beautiful plumage for the season, and I drew it, as I feel perfectly convinced Mr. Wilson has made an error in presenting the bird as a new species.

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[1] As is well known, Wilson's Autumnal Warbler (*Sylvia autumnalis*) is the Bay-breasted Warbler (*Dendroica castanea*) or the Black-poll Warbler (*Dendroica striata*), according to different authors, in first winter plumage, while Audubon, detecting the fact that it was a young bird of a known species, failed to identify it correctly. This was not at all strange, for at that early date much had to be learned of the immature plumages of our birds. I have good cause to state that some people are too ready to call Audubon careless when it was not carelessness but ignorance, which was perfectly natural and excusable in those days, and which he had neither time nor opportunity to correct until later.

Oct. 14th, 1820. We returned to our boat with a Wild Turkey, a Telltale Godwit and a Hermit Thrush which was too much torn to make a drawing of it; this was the first time I had met with this bird and I felt particularly mortified at its condition.

Nov. 2nd, 1820. Floated down slowly within two miles of Henderson, I can scarcely conceive that I stayed there eight years and passed therein comfortably, for it is undoubtedly on the poorest spot in the country, according to my present opinion.

Nov. 3rd, 1820. We left our harbor at daybreak and passed Henderson about sunrise. I looked on the Mill[1] perhaps for the last time, and with thoughts that made my blood almost run cold, bid it an eternal farewell.

Nov. 23rd, 1820. I saw two large Eagle's Nests, one of them I remembered seeing as I went to New Orleans eighteen months ago. It had been worked upon, and no doubt young were raised in it. It is in a large cypress tree not very high, made of very large dead sticks, and about eight feet in diameter.

New Orleans, Jan. 12th, 1821. Early this morning I met an Italian painter at the theatre. I took him to N. Berthoud's[2] rooms and showed him the drawing of the White-headed Eagle. He was much pleased took me to his painting apartment at the theatre, then to the Directors, who very roughly offered me $100 per month to paint with Monsieur l'Italien. I believe really now that my talents must be poor.

Jan. 13th, 1821. I rose up early tormented by many disagreeable thoughts, again nearly without a cent, in a bustling city where no one cares a fig for a man in my situation. I walked to Jarvis[3] the portrait painter and showed him some of my drawings. He leaned down, and examined them minutely, but never said they were good or bad; merely that when *he* drew an Eagle he made it resemble a Lion, and covered it with yellow feathers, or rather hair, not feathers, curious speech. Some people entered and

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[1] The Grist Mill erected by Audubon and Bakewell was completed in 1817 and still stands as a part of and adjoining the warehouse of Mr. David Clark, and is used for the storage of leaf tobacco.

[2] Nicholas Augustus Berthoud, brother-in-law of Audubon.

[3] John Wesley Jarvis, a self-taught portrait painter, who lived in New Orleans, Louisiana, in 1820–1821. Born 1780, died 1834.

were so well pleased with my Eagle that they praised it, and Jarvis rudely whistled. I called him aside while Joseph [Mason][1] rolled up my papers, and told him I had heard he required assistance to finish his portraits, *i.e.*, clothing and ground, and added that I had received good lessons from excellent masters. He asked me to come the next day and he would talk about it.

Jan. 14th, 1821. Called on Jarvis and did some work for him, but was but poorly paid, and found him so discourteous I shall not go again.

March 31st, 1821. I have spent my time these three days more at thinking than anything else, and often indeed have I thought my head very heavy. This morning I waited on Mr. Gordon[2] with a wish to receive from him an amendment to my letter to the President for all in my head is the Pacific expedition. I called on Mr. Vanderlyn,[3] the historical painter with my port folio, to show him some of my birds, with a view to ask him for a few lines of recommendation. He examined them attentively and called them *handsomely done*, but being far from possessing any knowledge of Ornithology or Natural History, I was quite satisfied he was no judge, but of their being better or worse shaded. Yet he spoke of the beautiful coloring and good positions, and told me he would with pleasure give me a certificate of *his having inspected them.* Are all men of talents fools and rude naturally, or intentionally? I cannot assert, but have often thought they were one or the other.

April 9th, 1821. Saw many birds of which I made a list, there are thirty-three. To see these in their haunts I was since half past two o'clock this morning until five this afternoon, wading often to my middle through the swamps, and then walking through the thickest woods I believe I have ever seen. Here is my list:

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[1] Joseph Mason, son of a gentleman in Cincinnati, Ohio, of whom Audubon writes in his Journal: "October 12, 1820. Left Cincinnati today with Capt. Cummings and Joseph Mason, a youth about 18 years of age, he is intended as a companion and friend as well as a pupil." He remained with Audubon until July, 1822.

[2] Alexander Gordon, a Scotchman, who married Ann Bakewell, youngest sister of Mrs. John James Audubon.

[3] John Vanderlyn, an historic painter, born 1776, died 23 September, 1852.

Mocking Birds, Orchard Orioles, Painted Buntings, Maryland Yellow-throats, Marsh Wrens, Water Crake, White-crowned Buntings, Indigo Buntings, Scarlet Tanagers, Turtle Doves, Tell-tale Godwits, Solitary Snipes, Bartram Snipes, Comorants, Sprig-tail Ducks, Purple Grackles, Blue Yellow-backed Warblers, Cardinal Grosbeaks, Yellow-billed Cuckoos, Large-crested Flycatchers, White-eyed Flycatchers, Nighthawks, Turkey Buzzards, Carrion Crows, Common Gulls, Carolina Wrens, Partridges, Cliff Swallow, Barn Swallow, Green-blue Swallow,[1] White-bellied Swallow, Bank Swallow, besides a species of Heron new to me, and to all the hunters here. I killed it near Lake Barataria. I have drawn it in an awkward position.

Aug. 21st, 1821. Watched all night by the dead body of a friend of Mrs. Percy[2]; he was not known to me and had literally drunk himself to an everlasting sleep. Peace to his soul. I made a good sketch of his head as a present for his poor wife. On such occasions time flies very slow indeed, so much so that it looked as if it stood still, like the Hawk that poises over its prey.

Nov. 2nd, 1821. Finished my drawings of the Crested Hawk,[3] which proved a female. How rare the bird is I may not say being the only specimen I have ever seen, though I once before found some tail feathers of another killed by a squatter on the Ohio, which tail feathers having been kept compared exactly with these of the present bird.

Nov. 10th, 1821. Continue my close application to my ornithology, writing every day from morning until night, omitting no observation, correcting, re-arranging from my notes and measurements, and posting up; particularly all my land birds. The great many errors I found in the work of Wilson astonished me. I try to speak of them with care, and as seldom as possible, knowing

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[1] In 'Birds of America,' 8vo, Vol. I, 1840, p. 176, we read "Green-blue or White-bellied Swallow, *Hirundo viridis*, Wils. Amer. Orn. Vol. III, p. 44." This shows that Audubon knew that these names referred to the same species and the enumerating of both in this list was evidently unintentional, though written at an earlier date.

[2] Mrs. Charles Percy of Bayou Sara, Louisiana, in whose home Audubon's wife lived while he was abroad from 1826 to 1830.

[3] No previous mention of this Hawk is recorded in this Journal.

the good wish of that man, the hurry he was in, and the vast many heresay accounts he depended on.

Nov. 25th, 1821. Since I left Cincinnati I have finished 62 drawings of birds and plants, 3 quadrupeds, 2 snakes, fifty portraits of all sorts, and the large one of Father Antonio, besides giving many lessons and I have made out to send money to my wife sufficient for her and my Kentucky lads, and to live in humble comfort with only my talents and industry, without *one cent* to begin on.

THE EFFECT OF ALTITUDE ON BIRD MIGRATION.

BY WELLS W. COOKE.

SURROUNDED by mountains, Asheville, North Carolina, is situated in the valley of the French Broad River, at an altitude of two thousand feet. Directly east is Raleigh, at about three hundred feet above ocean level. This difference in altitude causes quite a difference in the climate of the two places; the average temperature at Raleigh is about 60° F., while at Asheville it is five degrees colder. The former is in the Austro-riparian life zone, the latter at the extreme upper limit of the Carolinian. A difference in the avifauna naturally follows these variations in climate. The higher altitude of Asheville prevents some birds from occurring there that are found in summer at Raleigh. Among these may be mentioned the Chuck-will's-widow, Blue Grosbeak, and the Prothonotary Warbler. In a larger number of cases, birds remain through the winter at Raleigh that are seldom if ever found at Asheville during this season. Examples of this class are the Swamp Sparrow, Chewink, Brown Thrasher, and Ruby-crowned Kinglet. These all appear at Asheville as spring migrants.

A few mountain-loving species are regular visitors at Asheville, but occur as rare stragglers only at Raleigh. The Baltimore Oriole is a striking example, and the same preference is shown by the Olive-sided Flycatcher and the Blackburnian Warbler.

As would be expected, spring migration is, on the whole, later at Asheville than at Raleigh, and the voluminous records of the Biological Survey furnish data for a quite exact statement of the amount of variation in the times of arrival at the two places. The late J. S. Cairns sent migration notes for the years 1890 to 1894, inclusive, from the town of Weaverville, ten miles distant from Asheville; Minot Davis recorded the dates of arrival of the birds at Asheville in 1899, and W. M. Rackett the same data for 1902 at Weaverville. These seven years of observation furnish a satisfactory basis for estimating the average dates of arrival in this district. From C. S. Brimley, at Raleigh, the Biological Survey has received a very full report on migration for eighteen years, from 1885, the whole forming, probably, the largest amount of migration data ever recorded by one person at any one locality in the United States. With this amount of material at command, the movements of the birds at Raleigh can be ascertained with great accuracy.

Twenty-one species of common birds arrive in the spring at Raleigh, on the average, 3.6 days earlier than at Asheville, or one day earlier for each 1.4° F. that Raleigh is warmer than Asheville. Most of these birds were migrating during April, and for this month the temperature of the two localities differs scarcely four degrees. Therefore, it can be said that with reference to these two localities spring migration is delayed one day for each degree of cold. This relation, of course, would not hold good for other localities, though the migration between Raleigh and Washington is not much different. During April Raleigh averages six degrees warmer than Washington, and the birds average eight days in making the journey of the two hundred miles between the two places, or one and a third days for each degree of temperature. The trip from St. Louis to St. Paul is performed at a rate of about a day and a half for each degree of difference in temperature.

These statements are the averages of such widely differing quantities that they cannot be used to ascertain even approximately the time that any particular species requires in its passage from one locality to another.

The following dates show how greatly the different species vary in the time of their arrival at the two places, Raleigh and Asheville.

Species.	Average of the first seen.		Difference. Days.
	Raleigh.	Asheville.	
Black and White Warbler	March 26	April 2	7
Blue Gray Gnatcatcher	" 26	March 28	2
Parula Warbler	April 9	April 16	7
Rough-winged Swallow	" 11	" 14	3
Summer Warbler	" 13	" 15	2
Whip-poor-will	" 14	" 18	4
Ovenbird	" 14	" 20	6
Red-eyed Vireo	" 15	" 26	8
Yellow-throated Vireo	" 15	" 21	6
Kingbird	" 17	" 24	7
Wood Thrush	" 17	" 19	2
Ruby-throated Hummer	" 18	" 22	4
Great Crested Flycatcher	" 18	" 20	2
Hooded Warbler	" 18	" 20	2
Summer Tanager	" 20	" 22	2
Catbird	" 20	" 20	0
Wood Pewee	" 24	" 29	5
Chat	" 24	" 26	2
Indigo Bird	" 28	" 30	2
Black-poll Warbler	May 3	May 5	2
Yellow-billed Cuckoo	" 3	" 4	1
Average	April 17	April 21	3.6

In addition there are three species that move much more slowly; the Yellow-throated Warbler appears at Raleigh March 26 and is not seen at Asheville until April 21, a difference of 26 days. The corresponding dates for the Maryland Yellow-throat are March 30 and April 18, a difference of 19 days. For the White-eyed Vireo the times of arrival are April 2 and April 15, a difference of 13 days. These three are all early migrants, and it is true in general that the earlier a species moves northward in the spring the slower will be its average daily advance. All three find near Asheville their highest extension into the mountains, and it is possible that this fact may account for their delayed arrival. Though when birds are migrating in a level country the opposite is true,— they migrate more rapidly as they approach the northern limit of their range.

The most interesting phase of the comparison of migration at the two localities is connected with the time of arrival of the following species:

Species.	Average of the first seen.		Difference. Days.
	Raleigh.	Asheville.	
Solitary Vireo	March 26	March 10	16
Worm-eating Warbler . .	April 24	April 20	4
Scarlet Tanager. . . .	" 28	" 20	8
Black-throated Blue Warbler .	" 28	" 24	4
Rose-breasted Grosbeak . .	May 2	" 23	9

Each of these species appears at Asheville, in the mountains, before being seen at Raleigh, on the plains. The probable explanation of this anomaly is that each of these species breeds commonly at Asheville, and rarely or never at Raleigh. There is here a striking and unexpected exemplification of the rule that *the southernmost breeding birds constitute the van in spring migration.* While the present sum of knowledge is not sufficient to warrant the statement that this rule is universal, and very likely further investigation will show some exceptions, yet the above facts furnish strong evidence in its favor.

SPRING BIRD MIGRATIONS OF 1903.

BY ELON HOWARD EATON.

BIRD migration is a very elusive subject. At least we have found it so in western New York, after trying for years to determine its times and seasons, bird routes and isopiptoses, causes and results. Even if one could be everywhere all the while at the same time, it would be difficult to run down the last factor in this complex problem. Meanwhile we are after facts.

The writer has been greatly disappointed to find how imperfect are the records of observers in determining the presence of a bird at any given station, rendering it almost impossible to draw correctly the lines of simultaneous arrival. Consequently at Roches-

ter we have taken the observations of several workers at the same time, and thereby seek to determine the true time of arrival and degree of abundance of each species. It is quite surprising at our weekly meetings to learn that some common bird has been in the environs of the city for four or five days, perhaps, before many of us have seen it at all. By comparing and verifying observations we get much closer to the real facts.

Without burdening any one with a mass of detail, we wish to present some of the conclusions which have been reached as the result of observations made near Rochester during the spring of 1903.

First, regarding the yearly migration of hawks, it has been confirmed that an incredible number of these birds pass each spring along the southern shore of Lake Ontario and move toward the east over the country south of the lake, evidently making their way, around its eastern end, toward the north. The height of the migration occurs during the latter part of April and the first week in May. The birds are mostly Sharp-shinned and Broad-winged Hawks. A sprinkling of Marsh and Pigeon Hawks is always present, but surprisingly few of the Cooper's Hawk when its general abundance in many parts of the State is considered. It also seems unusual, at a time when Red-tailed and Red-shouldered Hawks are nesting in western New York, to see many of these species also, soaring high in the air and wheeling toward the east. This is not like the spring soaring of the Buteos over their nesting woods. Many are often seen together or in the same field of view and, as far as I have noticed on these occasions, they are absolutely silent, and when one party has passed off the scene another appears going in the same direction. Thus there is a constant whirling stream passing over, sometimes during the greater part of the day. When the wind is high the Hawks fly low, with less circling. The Sharp-shinned species flies lowest of all, and even in calm fair days, when Buteos are circling almost out of sight, this hawk moves mostly within gunshot. One morning at least one hundred of these birds passed over a single observer within two hours, and on another occasion we saw twenty-five of this species lying in one pile back of the little hotel on Buck Pond, where the proprietor had been trying his marksmanship after breakfast.

The writer was surprised to learn how many of these migrants are Broad-winged Hawks, but they were certainly a conspicuous part of the procession, from the 21st of April to the 17th of May. We were again reminded of this fact while spending the month of August near Lake Restoule in Canada, where the Sharp-shinned and Broad-winged Hawks were the commonest of the family. None of this latter species breeds about Rochester, and it is either of irregular distribution or much more a bird of the Northern Forests than we had previously supposed.

During the spring of 1903 there was a striking scarcity of some birds which are usually very common at our station. Among this number may be placed all warblers with the exception of the Myrtle Warbler, Mourning Warbler, Yellow Warbler, and Redstart. The Yellow-bellied Sapsucker was not more than one-fourth as abundant as in the preceding year; the White-throated Sparrow much less abundant than usual, and the Baltimore Oriole was, perhaps, sparingly represented.

Among the birds which were noted as unusually common were the Crested Flycatcher, Phœbe, Purple Finch, Junco, Indigo Bird, Yellow-throated Vireo, House Wren, Winter Wren, Ruby-crowned Kinglet, and Bluebird. The last-named species was certainly three times as abundant as in any spring since 1895. As many as twenty-seven of these birds were noticed in a single flock during the latter part of March. Their notes were everywhere heard along the roadside as one journeyed about the country.

The most peculiar feature of the spring migration of 1903 was the striking manner in which the general relationship between weather and bird waves was illustrated. During the third week in March a remarkably warm wave brought us the Phœbe and the Great Blue Heron on the 20th, at least a full week ahead of time; while the Robins, Bluebirds, Grackles, Blackbirds, and Meadowlarks, which had first appeared early in the month, became very common. Then as April progressed the season seemed to halt and falter. Although the average temperature was as high as usual, there was no decided warm wave. The early flowers came on in due time, but the leaving out of the trees was slow. April 29th found the shadbush just coming into bloom. On May 10 the foliage of the maples was about half out. Beeches, hornbeams,

and ash trees were just bursting the leaf buds. On May 12 apple orchards were in the height of bloom. But no great migration wave had reached us. Nearly all the May migrants were from four to nine days behind time. Twenty-five observers from the Bird Section of the Rochester Academy of Science were scouring the fields and groves, eager to make a full record of the migrations at our station. The birds did not escape us unless they did it at night. The nearest thing to a migration wave came on the 3rd of May when forty-eight species of birds, including five species of warblers, were seen by a single observer. These species were not all new arrivals, but many of them were. A southerly wind had prevailed throughout the preceding day and evening, but ended in cool, lowering weather. Two nights before ice had frozen one-fourth of an inch in thickness.

In 1902 the greatest bird wave of the season likewise occurred on the 3rd of May, when the same observer above referred to recorded seventy-five species of birds, including nineteen species of warblers. That, however, was a perfect day, warm and sunny, following a low cyclonic center moving from the southwest and culminating in a shower during the night. During the warbler season of 1903 there was no decided southwest cyclonic storm and no remarkable warbler wave. All concomitants of the season conspired to retard and dissipate any wave of migrants in early May. No warm southwest wind swept them upon us. The gradual unfolding of the leaves furnished no sudden opportunities of shelter and insect food. The nights, being uniformly clear and free from storms, did not compel the migrating hosts to halt in our territory. The northern species which came to us were only those which were induced to stop for rest and food as they leisurely pursued the journey toward their breeding grounds. The result of all of these causes was a gradual and uninterrupted stream of migration with little dash and rush and concentration.

These facts tend to show that the shyer, foliage inhabiting birds travel largely on the crests of warm waves advancing from the south, and as in western New York these waves usually come from the southwest, it is undoubtedly true that our birds mostly come from that direction. It is not true that birds migrate *only* with the aid of favoring winds; nor when the weather gets warm enough to

be grateful to their sensibilities; nor at night, coming to the earth when the rain or storm overtakes them; nor when a certain kind of food first makes its appearance. Nevertheless all these factors doubtless enter into the problem. Certainly there is a sudden increase of foliage-hunting insects when the leaves unfold. The foliage unfolds when the heat, moisture, and sunshine become favorable. Insectivorus, foliage-inhabiting birds would show little adaptation to their environments if they did not attend the feast spread for them. The food, protection, and grateful temperature are there all at the same time. The birds are there also as sure as the unfolding of leaves follows the advent of springtime, and the increase of insects accompanies the unfolding of the leaves, and the predacious insects the development of their prey. Thus natural selection has finally evolved a large number of species of birds with migratory habits.

THE CASE OF *MEGALESTRIS* VS. *CATHARACTA.*

BY J. A. ALLEN.

IT is claimed by Mr. Franz Poche in the 'Ornithologische Monatsberichte' for February, 1904 (Jahrg. XII, No. 2, p. 23), that the name *Catharacta* Brünnich, 1764, should replace *Megalestris* Bonaparte, 1856, on the ground of priority, and that Brünnich's name should be orthographically improved to stand as *Catarracta.* As this name has, by different authors, been used for several different groups and spelled in many different ways, its history has, in the present connection, considerable interest. It appears to have been first used, in what may be considered a generic sense, by the pre-Linnæan author Moehring in 1752, and in a subsequent edition of his work issued by Nozeman and Vosmaer in 1758. There is necessarily no reference in either edition of Moehring's work to the tenth edition of Linnæus's 'Systema Naturæ,' even the second edition being essentially prior to the beginning of the binomial system. Also, Moehring was not a bi-

nomialist. His form of the word was *Cataractes*, and it was used for the genus of Guillemots now currently known as *Uria*.

It was next employed by Brisson in 1760, as *Catarractes*, for the 'Gorfou' (*Phaëthon demersus* Linn.), a Penguin, now known as *Catarractes chrysocome;* and this constitutes the only tenable application of the name. In 1764 the same word, in the form *Catharacta*, was used in a generic sense by Brünnich for the Skuas. He refers in a footnote to the fact that Brisson had previously made use of the name as a generic designation for *Phaëthon demursus* Linn. (= *Catarractes chrysocome* auct., but which should stand as *Catarractes demursus* ex Linn.[1]), but adopts it, notwithstanding, for the Skua Gull because he thinks the name as used by the old authors referred to this bird. It should be noted that he renders Brisson's name, in this connection, with an *h*, — *Catharractes*, — further evidence that the two names are simply variants of the same word, the *Cataracta* of Pliny. The following is a list of some of the variants of it which have been used by different systematic writers:

Cataracta Retzius, 1800; Bonap., 1838, 1856, etc.
Catarracta Pallas, 1811; Leach, 1819; Poche, 1904.
Catharacta Brünnich, 1764.
Catharractes Brünnich, 1764.
Cataractes Moehring, 1752; Fleming, 1819; Gray, 1841.
Catarractes Brisson, 1760; Gray, 1846; Bryant, 1861.
Catarhactes Brandt, 1847.
Catarrachtes Hombr. & Jacq., 1841; Ogilvie-Grant, 1898.

As to the generic name of the Skuas, it cannot be *Cataracta*, nor *Catarracta*, nor *Cataractes*, nor *Catharacta*, each of which has been used for them, as all are preoccupied by *Catarractes* Brisson, which also has several variants, for a genus of Penguins; all are merely variants of an original *Cataracta* used by Pliny and other early authors for some apparently unidentifiable large oceanic bird. *Catharacta* Brünnich, were it otherwise tenable, is a synonym

[1] The name *demersus* appears to have been rejected for this species on account of a previous *Diomedea demersa* Linn. = *Spheniscus demersus* auct. mod.; but as *Phaëthon demersus* Linn. and *Diomedea demersa* Linn. refer to species belonging to different genera, there is no reason why the specific name *demersa* is not tenable for both.

of *Stercorarius* Brisson, which he intended it to replace, as shown by his citation of Brisson, although he included in it the Skua Gull, left in *Larus* by Brisson. His first species is *Catharacta skua*, and his second, *C. cepphus*, which he figured, including structural details, which thus renders it properly the type of *Catharacta*.[1]

Brisson (1764) founded the genus *Stercorarius* for the Jaegers, but left the Skuas in *Larus*. Illiger in 1811 proposed *Lestris* for the Jaegers and Skuas, citing both *Catharacta* Brünnich and *Stercorarius* Brisson, but recent authorities agree in considering *Lestris* a synonym of *Stercorarius*. Coues in 1863 adopted the name *Buphagus* for the Skuas, taking it from Moehring, 1752, but subsequently abandoned it, Moehring's names being pre-Linnæan and hence not available.

The first tenable generic name for the Skua Gulls is thus *Megalestris* Bonaparte, 1856, as now currently recognized.

The case of *Megalestris* vs. *Catharacta* temptingly offers a text for further remarks on general questions here involved. *Catharacta* presents a good example of the results of emendation, for whether used as a generic name for Penguins, Guillemots, or Skuas, the word occurs in several forms in each case, while the same form is found applied to more than one of the generic groups, the form employed varying with the preferences of the authors using the word. The forms *Catharacta*, *Cataracta*, *Catarracta*, *Cataractes*, and *Catarhactes* have, for example, all been applied to the Skuas, and also *catarrhactes* in a specific sense. As cases like this are frequent in zoölogical nomenclature, it is manifestly best to employ only the original form, even if faulty, and to apply the rule of priority to the forms of names as well as to the names themselves. Further, it is emphatically evident that of variants of the same word only the form having priority should be available, while all the others should be rejected.

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[1] The 'Code of Botanical Nomenclature,' prepared by a Nomenclature Commission of the Botanical Club of the American Association for the Advancement of Science, has been published since this article was sent to the printer (see notice of this Code in 'Recent Literature'), in which, under Canon 15, which deals with the selection of a nomenclatorial type of a genus or subgenus, it is provided: "(b) A figured species is to be selected [as the type] rather than an unfigured species in the same work."

On the other hand, names closely similar in form but known to be different etymologically and in significance, as *Picus* and *Pica*, *Simia* and *Simias*, should be accepted, but knowingly to add to the list of such names must be considered highly undesirable. Such cases are fortunately few, and afford no support for the recently proffered 'one-letter' rule, which would admit any number of literal variants of the same word, even where they fall not only into the same class of animals but even into the same family, as sometimes happens. Even the most strenuous supporters of this innovation are compelled to admit exceptions to its uniform application; and among those who accept it in a modified sense there is lack of agreement as to where the limit should be placed. The 'one-letter' rule would not only admit variants due to gender endings (*cf.* Poche, *l. c.*[1]), but to different connecting vowels in compound words, the use or non-use of the aspirate in certain classes of words of Greek origin, the use of *l* or *ll*, *r* or *rr* in many words, the use interchangeably of *i* and *y*, etc. Some who reject differences in gender endings as insufficient differentiation, like *Chlorurus* and *Chlorura*, admit differentiation due to the use of a different connecting vowel, as in *Contopus* and *Contipus*. It seems therefore more conducive to uniformity to maintain the usages of the A. O. U. Committee on Nomenclature in treating as homonyms all variants of the same word, as is generally the custom among naturalists at large, and also exclude emendations, and take names as first proposed by their originators, even if sometimes obviously faulty in construction, and extend, as already said, the rule of priority to the *forms* of names as well as to the names themselves.

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[1] Many cases can be cited where the same generic name has been used in all three genders by the same author in the same work or paper, or in different papers within a short period of time. On this point see Palmer (Index Gen. Mamm., 1904, p. 28) on the case of *Pogonias*. See also the same author (*l. c.*, p. 23) on 'emendations.'

ADDITIONAL NOTES ON THE BIRDS OF THE UPPER PECOS.

BY FLORENCE MERRIAM BAILEY.[1]

IN 1883 Mr. H. W. Henshaw and Mr. E. W. Nelson spent three months in New Mexico, on the Upper Pecos River which cuts through the southern end of the Rocky Mountains between the desert valley of the Rio Grande on the west and the high plains of the Rocky Mountain plateau on the east. Their camp, which, as Mr. Henshaw says, was the focus of their operations, was only a few miles north of a road that is now being made across the mountains connecting Santa Fé and Las Vegas. The bird notes taken during their stay were published in 'The Auk' under the title, 'List of Birds observed in Summer and Fall on the Upper Pecos River, New Mexico,'[2] but as their observations were restricted to an area of five square miles, more extended work in the region was left, as Mr. Henshaw explains, for "the labors of future investigators."

While engaged in Biological Survey work last summer, Mr. Bailey and I crossed from the Staked Plains to the southern end of the Rocky Mountains and spent six weeks on the Pecos Forest Reserve, following the Pecos Cañon through the section covered by Mr. Henshaw's notes (his camp was located at 7800 feet), packing up the mountains to the actual sources of the river, and climbing to the summits of Pecos Baldy, and the Truchas Peaks which, at an altitude of over 13,300 feet, mark the vertical faunal terminus of the region. As we entered the Pecos Cañon from the south on July 11, and after working up to the peaks left it again on August 24, we did not see the later migrants recorded by Mr. Henshaw, and since the bird work was only a part of the general biological work to be done, we, in turn, had to leave much to 'future investigators.' The species that we added to Mr. Henshaw's list were mainly Upper Sonoran foothill birds or those

[1] Published with the permission of Dr. C. Hart Merriam, Chief of the Biological Survey.

[2] 'The Auk,' II, 1885, pp. 326–333; III, 1886, pp. 73–80.

of the Hudsonian and Alpine zones found on or near the peaks. By reason of our more extended vertical work we were able to throw new light on the distribution of the species noted by Mr. Henshaw, fixing altitudes, and in some instances correcting inferences.

As the mountains are pointed with peaks reaching up to twelve or thirteen thousand feet, they attract abundant rains and are supplied with innumerable glacial lakes and streams, and consequently afford a rich vegetation and a wealth of insect life, which, in turn, support a numerically rich avifauna. Vertically the mountains offer congenial homes for a wide range of species, as they include, from the foothills to the peaks, the Upper Sonoran, Transition, Canadian, Hudsonian, and Alpine zones, with their characteristic trees from low piñones and junipers through yellow pines, spruces and firs, dwarf timberline pines and firs, dwarf willows fruiting at three inches, and finally on the peaks, dense mats of arctic plants. Correlated with the floral zones the birds range from Upper Sonoran Piñon Jays to Alpine Pipits and, in rare instances, Ptarmigan. Species like the Vesper Sparrow and Horned Lark, unusual mountain birds, find suitable homes on the broad, treeless, grassy mesas that, lying above ten thousand feet, extend for miles along the range, for, at this southern end the range is already beginning to broaden out into the Rocky Mountain plateau.

The exact locality covered by our list of birds is the core of the extreme southern end of the Rocky Mountains, that is, the north and south section drained by the Pecos River, specifically from the source of the Pecos at the foot of the Truchas Peaks southward to the mouth of the Pecos Cañon at the village of Pecos. To this is added an east and west section seven miles along the foothills on the lower edge of the Transition zone, from Pecos to Glorieta, where the Glorieta divide, on the Santa Fé R. R., separates the drainage of the Rio Grande from that of the Pecos River.

The foothill notes in the list that follows were made before entering the mountains, while the mountain list was made, as stated above, between July 11 and August 24, 1903.

Actitis macularia. SPOTTED SANDPIPER.—Two families of young were found at 8000 feet in the Transition zone where Mr. Henshaw found breeding birds. One brood left the nest on July 15, the other probably a week later. An adult male in beautiful, fresh winter plumage was shot on August 15 by the lake at the foot of Pecos Baldy, at 11,600 feet, and another, August 24, on the Pecos at 7200 feet.

Dendragapus obscurus. DUSKY GROUSE.—Grouse were found throughout the Canadian and Hudsonian zones, but the total number seen by our party during the month that we were in their country was only eleven cocks, nine hens, and six small broods of young. As the birds are supposed to lay from seven to ten eggs and the number of young attributed to four out of the six broods seen was respectively one, two, three, and four, we surmised that the severe mountain hailstorms had depleted the families. Near our camp at the foot of Pecos Baldy, Mr. Bailey discovered a winter roosting tree of the grouse. The tree was on a sheltered part of the wooded slope and was so densely branched that after a prolonged rain the ground beneath was perfectly dry. The earth was strewn with winter droppings, composed entirely of leaves of conifers. Conifer needles had also been eaten by three of the grouse that were taken, under our collecting permit, in July and August, but at this season the birds were living principally on such fresh food as strawberries, bearberries (*Arctostaphylos uvaursa*), shepherdia berries, flowers of the lupine and paint brush, seeds, green leaves, grasshoppers, caterpillars, ants, and other insects. One crop contained twenty-seven strawberries, twenty-eight bearberries, and twelve shepherdia berries, besides flowers, leaves, and insects, while the accompanying gizzard was filled with seeds, green leaves, and insects.

Lagopus leucurus altipetens. SOUTHERN WHITE-TAILED PTARMIGAN. —A cattleman and one of the range riders of the Reserve both reported having seen a few ptarmigan in previous seasons on the highest peaks, but although Pecos Baldy (12,600 feet) was climbed seven times by different members of our party and Truchas (13,300 feet) three times, our anxious search for the birds was not rewarded. It must be said, however, that on several of our ascents the wind was blowing a gale that would have driven most birds to cover. As this is the extreme southern limit of the Alpine zone in the Rocky Mountain system, and as there is a break of approximately thirty or forty miles in the Hudsonian zone between the high peaks of the Pecos Mountains and the Taos Mountains thirty or forty miles farther north, the range sweeping down to 9300 feet in the lower Canadian zone at Taos Pass, it is hardly to be expected that ptarmigan would be abundant on this isolated southern extremity of the range. There are, however, undoubtedly a few of the birds on the southernmost of the high peaks. At the southern end of the gap in the Hudsonian zone, the game warden told us, eleven years ago he found two of the ptarmigan near Mora Pass at an altitude of more than 11,000 feet. We did not succeed in finding any of the birds, however, even in the Taos

Mountains north of the pass, but, convinced that they must be there, Mr. Bailey, on leaving an assistant, McClure Surber, to collect in the region during the winter months, gave him special instructions to hunt for ptarmigan. The last of January Mr. Surber made a two days' snowshoe trip around the high peaks in the neighborhood of Gold Hill, where the snow had thawed and frozen until, as he said, "the surface crust was more slippery than ice." Here he finally discovered a flock of ptarmigan. One of the birds separated itself from the flock and led him up near the top of the peak, to about 12,500 feet he thought, when it lit within shooting distance. In describing it Mr. Surber says, "I was standing on an ice-covered boulder and just as I got a bead on it one of my feet slipped and in trying to save myself I dropped my gun. For a wonder the bird did n't fly, but my gun was about thirty feet below me and I did n't dare wait to get it. So pulling my revolver I fired and killed the ptarmigan." The specimen which, as Mr. Surber remarks, is a "good one in spite of the bullet," is a male in beautiful winter plumage and is now in the Biological Survey collection substantiating the previously vague reports of ptarmigan in New Mexico.

Meleagris gallopavo merriami. MERRIAM TURKEY.— For Colorado, Mr. Drew gives the breeding range of the turkey as 7000 feet, but in Mr. Mitchell's list of the birds of San Miguel County, New Mexico, he states that they are "common from 8000 feet to timberline." In the Pecos Mountains we were told that they were still common at 11,000 feet, but by the time we reached that altitude, as the game warden explained, they were probably on their way down the mountains. At all events, only four were seen by our party. Mr. Vilas, a cattleman of the country, told us that in the fall they go down to the nut pine and juniper mesas in the Glorieta region and, gathering at the few springs that furnish drinking places, are shot by wagon loads by the Mexicans. The only specimen we obtained was taken July 27 at over 11,000 feet. Its crop and gizzard held mainly grasshoppers and crickets, but also grass seed, mariposa lily buds, and strawberries, while its gizzard contained in addition a few beetles.

Columba fasciata. BAND-TAILED PIGEON.— Mr. Henshaw found the pigeons feeding on elderberries and acorns, but in the scarcity of acorns last summer there were few pigeons. Less than a dozen were seen by us in the mountains, though it must be said that we did not do much work in their section. All but two of those seen were at about 10,000 feet on the upper edge of the Transition zone, the others being at 11,400 feet, evidently only flying over. The only specimen secured had nothing but insects, mainly grasshoppers, in its gizzard.

Zenaidura macroura. MOURNING DOVE.— The unmistakable voices of Mourning Doves were heard at Glorieta on July 8.

Cathartes aura. TURKEY VULTURE.— Mr. Henshaw reported the Vulture as common, but we saw only a few of the birds, and most of these at 11,000 feet, when the mammalogists were running a line of meat-baited traps.

Accipiter cooperi. COOPER HAWK.— One was seen near Glorieta on July 4 flying with a small mammal in its claws.

Buteo borealis calurus. WESTERN RED-TAIL.— Red-tailed Buteos were seen about our camps at 8000 and 11,000 feet.

Aquila chrysaëtos. GOLDEN EAGLE.— Several eagles were observed over the highest peaks. A young one was seen soaring over Pecos Baldy August 18, the white base of its tail showing brilliantly in the sun.

Haliæetus leucocephalus. BALD EAGLE.— Two or three Bald Eagles were reported at about 8000 feet on the Pecos August 20.

Falco mexicanus. PRAIRIE FALCON.— A Falcon that Mr. Bailey took to be the Prairie was seen August 14 beating up against a storm, attempting to round the peak of Pecos Baldy.

Falco sparverius phalœna. DESERT SPARROW HAWK.— Near Glorieta a pair of Sparrow Hawks were feeding young inside a cottonwood knothole on July 8. Of the few individuals noted in the mountains one was seen August 11 flying over Truchas Peak (13,300 feet) and another August 13 flying over Pecos Baldy (12,600 feet). Twice the hawks were seen disputing with Clarke Crows, once at our Hudsonian camp when the hawk and nutcracker took turns chasing each other out of camp.

Bubo virginianus pallescens. WESTERN HORNED OWL.— The remains of a Horned Owl were found near Glorieta and the birds were heard at 8000 and 11,000 feet, while a feather of one was found halfway up the peak of Pecos Baldy.

Ceryle alcyon. BELTED KINGFISHER.—Mr. Henshaw states that although several kingfishers were seen along the Pecos in the fall they did not breed in the locality, but we found them on the Pecos July 11 and 16 at an altitude of about 7800 and 8000 feet.

Dryobates villosus monticola. ROCKY MOUNTAIN HAIRY WOODPECKER.— Hairy Woodpeckers were noted at different altitudes, from 7400 feet on the lower edge of the Transition zone to 11,600 feet in the Hudsonian zone. The gizzard of a young male shot was full of hard-bodied insects. At 11,600 feet on August 15 a family of grown young were going about feeding themselves, calling and drumming. In watching them the red crown patches of the young were so conspicuous as they turned their heads in pecking at the bark that they suggested a possible advantage as recognition marks. Does a parent coming with grubs distinguish its son from its mate a tree away by the red crown? It is certainly a convenient mark from the foot of the tree.

Picoides arcticus dorsalis. ALPINE THREE-TOED WOODPECKER.— A pair of Three-toed Woodpeckers were feeding young about our Hudsonian camp at 11,600 feet August 14. An old male and one of the brood were seen on the same tree, the young one picking about for itself while its parent dug larvæ out of the live bark and fed them to it. A young Dryobates flew down while they were enjoying the meal and finally succeeded in driving them off, although they scolded angrily as they went. The stomachs of two adults and one young were full of the larvæ of tree insects.

Sphyrapicus varius nuchalis. RED-NAPED SAPSUCKER.— *Nuchalis* was seen on the Pecos in the Transition zone at 8000 feet.

Sphyrapicus thyroideus. WILLIAMSON SAPSUCKER.— A pair of *thyroideus*, collected at about 8000 feet, had their stomachs full of ants. The highest altitude at which the birds were seen was 9500 feet.

Melanerpes formicivorus. ANT-EATING WOODPECKER.— A single individual was reported near Glorieta about July 8.

Colaptes cafer collaris. RED-SHAFTED FLICKER.— Flickers were fairly common in the mountains from 7400 to 11,600 feet, where we found a pair feeding young nearly ready to fly on August 16. The adults were then calling vociferously. At 11,000 feet an old bird was feeding full grown young, out of the nest, August 6. At 13,000 feet, in a protected timberline alcove on the south side of Truchas, a flicker was seen on August 11 with a party of migrants.

Phalænoptilus nuttallii. POOR-WILL.— A Poor-will was heard at dusk near Glorieta early in July.

Chordeiles virginianus henryi. WESTERN NIGHTHAWK.— Nighthawks were heard booming near Glorieta about July 8.

Aëronautes melanoleucus. WHITE-THROATED SWIFT.— A single swift was seen flying over the top of Pecos Baldy on July 31. In San Miguel County, Mr. Mitchell says, it is "not common." "Breeds in cliffs during May from 8000 feet to timberline."

Selasphorus platycercus. BROAD-TAILED HUMMINGBIRD.— The Broad-tail was fairly common from 7000 feet at Glorieta to 11,600 feet at the foot of Pecos Baldy, where numbers were seen as late as August 16. Others were noted the second week in August flying over the saddle of Pecos Baldy at 12,000 feet, at timberline on Truchas at 12,300 feet, and going over the peak of Baldy at 12,600 feet. The throat of one shot was full of honey and long-tailed, wasp-like insects. On August 25 two young *platycercus* were taken from a flock of hummingbirds three miles south of Pecos in the juniper and piñon pine belt.

Selasphorus rufus. RUFOUS HUMMINGBIRD.— The large numbers of hummingbirds recorded by Mr. Henshaw were absent from the section of the mountains that we visited. On July 25 we made an eight mile horseback trip to secure a pair that Mr. Bailey had located at some flowering spirea and holodiscus bushes at 10,200 feet. Later on we found the birds as high as 12,600 feet, above timberline, on Truchas Peak, and saw one flash across the saddle of Baldy at 12,000 feet. The species does not occur at all in Mr. Mitchell's list of the birds of San Miguel County, which indicates at least that it is not abundant on the east slope of the range in this region. The only large gathering of hummingbirds that we encountered was on August 25 at the southern base of the mountains, three miles south of Pecos. Here a patch of thistles in the bottom of a dry wash had attracted about thirty hummingbirds of various species. As they were nearly all females or young we could not tell what they were, but there was one adult male *rufus*, and young of *platycercus* and *calliope* were both taken.

Stellula calliope. CALLIOPE HUMMINGBIRD.— Two specimens were secured during the summer, one at 11,000 feet on August 8, and one three miles south of Pecos on August 25.

Tyrannus vociferans. CASSIN KINGBIRD.— Reports of *vociferans* were brought us by McClure Surber from Glorieta on July 8, and from 8000 feet on August 19.

Myiarchus cinerascens. ASH-THROATED FLYCATCHER.— In the juniper belt near Glorieta *Myiarchus* was found about July 8.

Sayornis saya. SAY PHŒBE.— On August 14 Mr. Bailey found a Say Phœbe on an open ridge at 12,000 feet, where *Myadestes*, *Anthus*, and *Otocoris* had been found previously. At Glorieta one had been seen around an adobe about July 8.

Nuttallornis borealis. OLIVE-SIDED FLYCATCHER.— *Nuttallornis* was found in the Canadian and Hudsonian zones from Willow Creek at 7800 feet to the foot of Pecos Baldy at 11,600 feet, its familiar call often coming from the tip of a picea spire.

Contopus richardsonii. WESTERN WOOD PEWEE.— *Richardsonii* was seen in the Transition zone from 7000 to 8000 feet.

Empidonax difficilis. WESTERN FLYCATCHER.— Common from 8000 to 11,000 feet, evidently breeding at 11,000 feet on July 15. Mr. Henshaw saw young accompanied by the parents July 19, and on Jack Creek, at 11,000 feet, Mr. Bailey found a nest containing four young on August 5.

Otocoris alpestris leucolæma. DESERT HORNED LARK.— At least half a dozen Horned Larks, among them full grown young, were found with a band of Pipits on a broad open slope at 12,000 feet. They were discovered on July 28, on our first visit to timberline, and found in the same place a number of times afterwards. Two specimens were secured which Mr. Oberholser identified as *leucolæma*.

Pica pica hudsonia. BLACK-BILLED MAGPIE.— Four magpies and three or four ravens were seen August 6 sitting on a corral on the open mesa at 10,400 feet. The carcass of a cow was evidently the attraction and the ravens were trying to drive off the magpies when discovered. On being disturbed the birds all flew off down into the timber.

Cyanocitta stelleri diademata. LONG-CRESTED JAY.— *Cyanocitta* was found from the lower edge of the Transition zone yellow pines through the firs and spruces of the Canadian zone, but at 11,000 feet it was largely replaced by *Perisoreus*. At 7000 feet, near Glorieta, about July 8, a family of six were seen going around together. At 8000 feet, on July 16, an old jay brought its brood into the bushes on the edge of camp, running out into the grass a few yards from our tent to pick strawberries for them. On August 21, at the same altitude, we found another pair of jays going about with their young.

Aphelocoma woodhousei. WOODHOUSE JAY.— On the Pecos *woodhousei* was found as high as 7000 feet, for although the cold slopes of the cañon walls are pineclad at this altitude, the warm slopes are covered with Upper Sonoran junipers and nut pines.

Perisoreus canadensis capitalis. ROCKY MOUNTAIN JAY.— *Perisoreus* was common from 11,000 to 11,600 feet. At 11,000 feet a family of young was found out of the nest on July 23, and on August 4 a full grown young one was caught in a meat trap. Two old birds were also caught in traps baited for martins and foxes, although the traps were partly covered up in the daytime to protect the jays. At this camp the birds stopped only as they went by and did not come within several rods of camp. When we moved up to the foot of Pecos Baldy, however, camping among the dwarf spruces of the Hudsonian zone, the jays flocked around us, joining us at meals with characteristic fearlessness. The only wild food that we saw them eat was toadstool. On our way down the mountains, August 17, we found *Perisoreus* as low as 10,800 feet, near the junction of the Canadian and Transition zones.

Corvus corax sinuatus. AMERICAN RAVEN.— A family of ravens was seen near Glorieta July 10, and another at the foot of Pecos Baldy, 11,600 feet, on July 23. Other ravens were seen flying over the peak. At our 11,000 foot camp *sinuatus*, like the jays and vultures, was attracted by the line of meat baited traps, going so far as to spring some of them and take the bait.

Corvus americanus. CROW.— Although Mr. Henshaw thought the Crows did not breed at this altitude, a few were seen on the Pecos near El Macho, at 7200 feet, and on July 16 two or three families were noted five or six miles above El Macho at about 7600 feet, squawking young being led about by their parents.

Nucifraga columbiana. CLARKE NUTCRACKER.— At our Canadian zone camp a few nutcrackers stopped in the treetops to inspect us in passing, but at our Hudsonian camp they came familiarly for food with the Rocky Mountain Jays. While not so tame as *Perisoreus* they would come within two or three rods of us. They abounded at this level and frequented the dwarf pines near timberline above us. One of the birds was seen shooting down over the top of Pecos Baldy in characteristic fashion. In the woods two of the nutcrackers were seen by Mr. Bailey running up and down a log bordered by blooming larkspurs, chasing sphynx moths that were feeding from the flowers. The moths were darting about and Mr. Bailey did not see any caught. On leaving the mountains in August we found the nutcrackers in the pines as low as 8000 feet, and in rounding the south end of the range, on the way to Las Vegas, the last of August we saw a few scattered individuals as low as 6000 feet in the piñon pine and juniper belt.

Cyanocephalus cyanocephalus. PIÑON JAY.— At 7000 feet, on the upper edge of the Upper Sonoran zone, a large flock of Piñon Jays was seen flying high overhead on August 11, and on August 12 a flock of six or eight wanderers was found feeding on the ground at timberline, 12,300 feet, on the side of Truchas Peak.

Sternella magna neglecta. WESTERN MEADOWLARK.— Mr. Mitchell says the meadowlark breeds as high as 8000 feet in San Miguel County,

but we saw it last a few miles north of Pecos, as in following up the Pecos Cañon there were no suitable breeding grounds for it.

Hesperiphona vespertina montana. WESTERN EVENING GROSBEAK. — Along the Pecos at about 8000 feet Evening Grosbeaks were found near the middle of July going about in flocks and feeding on the ground around roadside springs. The birds, as we inferred from their actions and as their stomach contents proved, were eating small insects which they picked up from the surface of the ground or dug up from under roots or stones. When first discovered they were so tame that we could get within a few feet of them. In a flock of twenty or thirty males only two females were seen. In going up the mountains we found a few pairs at about ten thousand feet near the junction of the Transition and Canadian zones. On our return down the mountains in August only one or two individuals were noted where the large flocks had congregated in July, and as grosbeak voices were heard below Pecos we inferred that the birds had gone down into the juniper and piñon pine country to gather berries.

Pinicola enucleator montana. ROCKY MOUNTAIN PINE GROSBEAK.— Two pairs of Pine Grosbeaks were seen in the Canadian and Hudsonian zones, and one family with grown young was found by Mr. Bailey on August 14 near the Truchas lakes at the head of the Pecos River at 12,000 feet. Both adult and young were taken. The crop and gizzard of the young were stuffed full of small white oval seeds, while the stomach of the adult contained the same seeds with the addition of a few spruce needles, a spruce flower, and a small green caterpillar.

Carpodacus cassini. CASSIN FINCH.— In a flock of Evening Grosbeaks feeding at a spring on July 15, we discovered a solitary male Cassin Finch, the only one seen during the season.

Carpodacus mexicanus frontalis. HOUSE FINCH. — In Colorado the House Finch breeds up to 8000 feet, but on the east side of the Las Vegas range Mr. Mitchell did not find it "to any great extent"; in the Pecos Mountains Mr. Henshaw did not find it at all, and we saw it only at the base of the range between Pecos and Glorieta.

Loxia curvirostra bendirei. BENDIRE CROSSBILL.— At 11,000 feet the crossbills were common, flying about among the cone-laden spruce tops and, hunger appeased, stopping to sing their quaint, pleasing song. At 11,600 feet they were occasionally heard flying over, and on our way down the Pecos, August 21 and 22, they were seen at 8000 feet and again at 7400 feet.

Astragalinus psaltria. ARKANSAS GOLDFINCH. — Goldfinches were found in the cottonwoods at Glorieta July 7.

Spinus pinus. PINE FINCH.— Siskins were seen from 7500 to 11,600 feet, but they were most abundant at 11,000 feet, where they were constantly singing and flying about in small squads, which were probably families. On August 17, as we came down the mountains, a family of young was found out of the nest at 10,400 feet.

Pœcetes gramineus confinis. WESTERN VESPER SPARROW. — Mr. Henshaw secured a single individual which, he says, "was doubtless merely a migrant which had strayed from its proper territory lower down on the plains." The broad grassy mesas of the upper parts of the mountains, however, are ideal breeding grounds for the Vesper Sparrow, and on one of these meadows, at 10,400 feet, the birds were found singing a number of times between July 25 and August 17, one being taken on July 25. In Colorado the Vesper Sparrow breeds commonly to 9000 feet, and sometimes up to 12,000 feet.

Coturniculus bairdii. BAIRD SPARROW. — On August 11 Mr. Bailey took a Baird Sparrow on one of the open mesas near timberline. Others were secured September 2 on the high plains north of Las Vegas.

Zonotrichia leucophrys. WHITE-CROWNED SPARROW. — Mr. Henshaw states that the White-crown is "present only as a rare migrant, it being too far south for the species to breed." Of course it is now known that the breeding range extends, as Mr. Ridgway gives it, "southward to New Mexico and Arizona (San Francisco Mountains)," but had Mr. Henshaw visited the higher levels of the Pecos Mountains he would have extended the range himself, for he would have found the birds abundant breeders there. As in the Sierra, *leucophrys* is one of the commonest and most characteristic birds of the Hudsonian zone. The birds were singing up to timberline on Pecos Baldy as late as the middle of August, and the willows at the base of the peak were alive with them. A molting adult was found carrying food on August 8. In the willows bordering Jack Creek, at 11,000 feet, a nest contained one egg and two young nearly ready to leave the nest on July 27. In watching the parent birds I was struck by their use of their crest. We had been told of a bird with a white crown and I found that when wanting to attract attention, to draw one from the nest, *leucophrys* often spreads its crown so wide that the black bordering stripes might easily be overlooked, the white then serving as a good recognition mark. But, on the other hand, when the birds wanted to steal unobserved through the willows to the nest, they lowered the crown so flat that the black and white lines were of almost equal width.

Spizella socialis arizonæ. WESTERN CHIPPING SPARROW. — Mr. Henshaw found *arizonæ* "an abundant summer resident" of the Transition zone, and we found a nest with nearly grown young at Glorieta July 8, and found the birds common at 11,000 feet, where young, out of the nest, were being fed on July 23. The sparrows were fairly common in the Hudsonian zone the second week in August, and were seen August 11 at timberline, 11,300 feet, on the south side of Truchas.

Junco dorsalis. RED-BACKED JUNCO. — A single specimen of *dorsalis* was taken at 8000 feet on July 13. It was taken near a nest from which we had flushed a Junco the day before.

Junco caniceps. GRAY-HEADED JUNCO. — Juncos were breeding abundantly at 11,000 feet, nests being found everywhere in the open. On July 22 a nest was found containing partly feathered young; on July 24 one

nest of three eggs, and two broods out of the nest were found; on July 25 young were seen going about with their parents; on July 30 a nest was found with one egg and newly hatched young; on July 31 a nest of four eggs was discovered; on August 6 an old bird was seen feeding young in a tree; August 7 a nest was found with four eggs, and on August 15 an old Junco was seen collecting food. All of the nests were on the ground, completely hidden by tufts of grass or bunches of weeds, being discovered only by flushing the brooding bird. When the Junco is not flashing its white tail feathers its rufous back may well serve its relatives as a recognition mark, especially in the dull light on the edges of clearings where other small birds gather.

Melospiza lincolni. LINCOLN SPARROW.—This was the only *Melospiza* found in the mountains, although we were on the lookout for *montana*, and in San Miguel County Mr. Mitchell says it breeds from 7000 to 9000 feet. Mr. Henshaw says that *lincolni* "evidently does not occur in summer," but we found it breeding in the higher parts of the mountains, both on Jack Creek at 11,000 feet, and by the lake at the foot of Pecos Baldy at 11,600 feet. Young were being fed out of the nest at 11,000 feet on July 29.

Pipilo maculatus megalonyx. SPURRED TOWHEE. — Mr. Henshaw found only one or two pairs of *megalonyx* and we saw the bird only once or twice in the mountains, but found it fairly common in the foothills between Pecos and Santa Fé on the lower edge of the Transition zone.

Pipilo fuscus mesoleucus. CAÑON TOWHEE.— *Mesoleucus* is one of the common cañon birds of the Upper Sonoran juniper and nut pine belt and follows its zone up the Pecos to its limit at 7200 feet.

Oreospiza chlorura. GREEN-TAILED TOWHEE.— We obtained a single specimen of *chlorura* on July 13 at 8000 feet, and Mr. Henshaw found one brood and saw a few migrants.

Zamelodia melanocephala. BLACK-HEADED GROSBEAK.— A male grosbeak was taken July 15 at 8000 feet, one was seen July 20 at 8700 feet, and a female was obtained at about 10,000 feet, near the upper limit of the Transition zone.

Guiraca cærulea lazula. WESTERN BLUE GROSBEAK?— A Blue Grosbeak was reported on August 6 about eight miles north of Pecos in the Upper Sonoran zone. Another was seen earlier in the season between Glorieta and Pecos.

Piranga ludoviciana. WESTERN TANAGER.— At 8000 feet we found a pair of tanagers feeding young on the edge of camp July 16. The song and call notes were constantly in our ears. When the female was away the male would sit on a branch and call *pit-ic, pit-ic, pit-ic* by the half hour. He would call in the same way when hunting for food, moving slowly and quietly over the cottonwood branches. The female often gave a three syllabled call of *pit-er-ick, pit-er-ick.* A nestling that I succeeded in catching in my hand, much to the temporary distress of the old birds, was, as Mr. Ridgway says, marked much like the female. Its upper

parts were olivaceous and the wings were crossed by two yellowish bars. The throat, but not the chest, was streaked, and the belly was whitish, its median line and the under tail coverts being bright yellow. Tanagers were seen on July 19 at 8700 feet and July 25 at 10,200 feet, on the upper edge of the Transition zone. Before this they had been found in the foothills between Santa Fé and Glorieta. On August 27 we saw one as low as 6350 feet at the foot of the pine-covered Bernal mesa.

Progne subis. PURPLE MARTIN.— Martins were found near Glorieta July 10.

Petrochelidon lunifrons. CLIFF SWALLOW.— Seen between Glorieta and Pecos on July 4.

Hirundo erythrogastra. BARN SWALLOW.— At 7200 feet Barn Swallows were seen on August 24, and they were common about Mexican adobes at the base of the mountains during the summer.

Tachycineta thalassina lepida. NORTHERN VIOLET-GREEN SWALLOW.— *Tachycineta* was found from near Glorieta at the base of the mountains up to 11,000 feet, but was most abundant at 8700 feet. Near Glorieta on July 10 we found the Violet-greens nesting in cottonwoods; at 8700 feet on July 19 they were evidently breeding in crevices in the rocks, flying about the brow of a cliff in great numbers; and on July 25 we found a large community of them breeding in an aspen grove on the mesa at 10,300 feet. A grown young was secured in this place on August 14. Mr. Henshaw found the swallows principally in the pine woods.

Vireo gilvus swainsoni. WESTERN WARBLING VIREO.— At Glorieta the Warbling Vireo was singing in the cottonwoods on July 7, and at 8000 feet one was singing and carrying food on July 15. Others were found as high as 10,300 feet in the poplars on the mesa.

Vireo solitarius plumbeus. PLUMBEOUS VIREO.— Mr. Henshaw speaks of *plumbeus* as "rather common in summer," being "almost exclusively restricted to the pines"; but we found it only on the lower edge of the pine belt at the base of the mountains in a cottonwood grove near Glorieta.

Helminthophila virginiæ. VIRGINIA WARBLER.— Mr. Henshaw was surprised at the absence of the Virginia Warbler, which "breeds abundantly in middle Colorado," and suggested that "it may possibly summer in the foothills." That this is the case we proved by taking a specimen on July 10 near Glorieta on the lower edge of the Transition zone.

Helminthophila celata. ORANGE-CROWNED WARBLER.—Taken at about 8000 feet on the Pecos July 16.

Helminthophila celata lutescens. LUTESCENT WARBLER.— Taken at 8000 feet on August 19.

Dendroica auduboni. AUDUBON WARBLER.— These warblers were found from 7000 to 11,600 feet, where, on August 12, they were going about in fall flocks of Juncos, Kinglets, and Warblers.

Geothlypis tolmiei. MACGILLIVRAY WARBLER.— Mr. Henshaw, while expecting to find *tolmiei* breeding, saw it only as a migrant late in August, but we secured a specimen on July 15 on a branch of the Pecos at 8000 feet, so it doubtless breeds in the vicinity.

Wilsonia pusilla pileolata. PILEOLATED WARBLER.— Mr. Henshaw says, "So far as we could ascertain, this bird did not breed in the locality," but higher up the mountains, at 11,000 feet, on July 23, we found it feeding young in the willows along Jack Creek. The parent bird was, at the time, in the middle of its molt. When we came down the mountain the latter part of August we found *pileolata* in the alders along the streams in the same surprising numbers that Mr. Henshaw had noted.

Anthus pensilvanicus. PIPIT.— Instead of the Ptarmigan and Leucosticte that we had hoped to discover on the peaks, we found the Pipit, the one Alpine bird. This was not surprising, as the snow had melted back to small patches on the cold slopes in time to give it an open breeding ground. From a little below timberline we found the birds ranging to the highest peaks, actually encountering them in a fierce wind within fifty feet of the summit of Truchas, at an altitude of 13,250 feet. From the top of Pecos Baldy another day I discovered, high in the air, a Sparrow Hawk pursued by a Pipit. As this was on the thirteenth of August the Pipit was probably guarding his brood, for we had found young being fed as late as July 28. The breeding ground where we discovered them was a broad grassy slope, an ancient 'burn' near timberline where *Otocoris* was going about with grown young. Some of the Pipits had food in their bills and they did individually what they do in flocks after the breeding season,— rose from the ground, flew out and circled back, uttering their plaintive *cheep*. In this case they often lit on old gray stumps and logs. On July 31 we found the birds on both sides of the knifeblade rocky ridge connecting the east and west peaks of Pecos Baldy flying about cheeping, blown by the wind, and lighting on the rocks and tipping their tails; but though they acted most suspiciously, we did not succeed in finding nests or young.

Cinclus mexicanus. WATER OUZEL.— The Ouzel was seen on the Pecos from 7200 to 8700 feet in July and August. At 8700 feet we left the Pecos, following up Jack Creek to the foot of Pecos Baldy. This stream probably had too few cascades to suit the ouzels, but on the north slope of Baldy, at 10,000 feet, Mr. Bailey again encountered them. The gizzard of one collected was full of small insects.

Salpinctes obsoletus. ROCK WREN.— Mr. Mitchell says that the Rock Wrens breed "most commonly from 8000 feet down, and although a few individuals were seen by us in the mountains, one being met at 12,550 feet, fifty feet from the top of Pecos Baldy we missed the friendly little fellows in the high country, for they had met us at every turn along the sandstone of the low country.

Troglodytes aëdon aztecus. AZTEC WREN.— On July 10 we found two wren nests in holes in cottonwoods at our Glorieta camp, and on July 14, at 8000 feet, were shown a family of nearly fledged young which the children of the range rider had rescued from a snake that climbed to its nest. On August 9, wrens were singing at 11,600 feet.

Certhia familiaris montana. ROCKY MOUNTAIN CREEPER.— Young

creepers were seen at 11,600 feet on August 14 and 16, and one was taken at 8000 feet on August 18.

Sitta carolinensis nelsoni. ROCKY MOUNTAIN NUTHATCH.— In going about the mountains we thought a number of times that we detected the notes of *nelsoni* at a distance, and we were doubtless right, for Mr. Henshaw found them breeding abundantly in the pines. They were, moreover, taken at our Glorieta camp on the lower edge of the yellow pines as well as on pineclad mesas on the plains.

Sitta pygmæa. PYGMY NUTHATCH.—During July and August the Pygmy was found throughout the limits of the Transition zone from 7400 to 9800 feet.

Bæolophus inornatus griseus. GRAY TITMOUSE.— As *griseus* is a common bird of the piñon pine and juniper belt and was found in the Glorieta region, it would doubtless have been found on the Upper Sonoran slopes of the Pecos cañon had we stopped to work them.

Parus atricapillus septentrionalis. LONG-TAILED CHICKADEE.—A family of nine were seen August 17 at 8000 feet, and one was taken at about 10,500 feet. Its gizzard was filled with minute eggs and some insects.

Parus gambeli. MOUNTAIN CHICKADEE.— While *septentrionalis* was seen only twice, *gambeli* was common at Glorieta and on the mountains in the Canadian and Hudsonian zones.

Psaltriparus plumbeus. LEAD-COLORED BUSH-TIT.— Like *Bæolophus*, a typical bird of the juniper and nut pine country, *Psaltriparus* was found in the Glorieta foothills, and was undoubtedly on the Upper Sonoran slopes of the Pecos Cañon.

Regulus satrapa. GOLDEN-CROWNED KINGLET.—A young *satrapa* in pinfeathers was taken July 31 on Pecos Baldy. As this gives a breeding record it makes a long southward extension of the breeding range.

Regulus calendula. RUBY-CROWNED KINGLET.— On July 21, when we camped in the spruces at 11,000 feet, the Kinglets were in the height of their song, their cheery round being heard all through the day as they made their circuits of the spruce tops above camp. By August 1 their songs were much less in evidence, probably for good family reasons. By August 9 their songs were so rarely heard as to be notable, and before we left the foot of Pecos Baldy, August 17, the young were flying about quite independently.

Myadestes townsendii. TOWNSEND SOLITAIRE.— A pair of *Myadestes* was seen about July 15 at 8000 feet, and a grown young one was shot July 28 at 11,000 feet. On the same day a nest with four fairly fresh eggs was found at 12,000 feet. The nest was on the same grassy ridge where *Anthus* and *Otocoris* were flying about. As we rode along on horseback the bird flew from under an old gray log at our feet, and on dismounting we found the nest on the ground roofed over by a cavity burned in the log just about large enough to give head space to the Solitaire. The nest was made wholly of grass and weed stems and lined with fine grass. On the side of Pecos Baldy *Myadestes* was seen above 12,000 feet, and on Truchas above timber-

line on straggling dwarf spruces at 12,600 feet. At our Hudsonian zone camp at 11,600 feet we saw a number of the birds up to the time of our departure, on August 17. On our way down the mountains we found it as low as 8000 feet, whether having bred there or having come down after the cold storms we could only surmise.

Hylocichla guttata auduboni. AUDUBON HERMIT THRUSH.— When we camped in the spruces at 11,000 feet Hermit Thrushes were singing in chorus in such unusual numbers that we called the place Hylocichla Camp, but by August 1 the thrushes had almost stopped singing. On July 23 we found a young bird out of the nest, and from that time on encountered bob-tailed young in the woods until August 15, just before our departure for the lowlands. The stomach of a thrush shot contained insects and a few berry seeds, probably strawberry.

Merula migratoria propinqua. WESTERN ROBIN.— Mr. Henshaw says the Robin "was not detected breeding, although it probably summers here." During our stay the birds were found from Pecos to the foot of Pecos Baldy. At 8000 feet, on July 15, we found young being fed out of the nest; on July 16 we found a pair just about finishing a nest; on July 23 a nest was seen with eggs at 11,000 feet; on August 20, young were found being fed in the nest at 8000 feet. On August 16, at 11,000 feet, we saw a tailless old bird in the midst of its molt.

Sialia mexicana bairdi. CHESTNUT-BACKED BLUEBIRD.— On July 10 *bairdi* was found nesting in a cottonwood near Glorieta. In the mountains it was seen as high as 10,200 feet.

Sialia arctica. MOUNTAIN BLUEBIRD.— Mr. Henshaw says, "Apparently the *Sialia arctica* does not breed here"; but Mr. Mitchell gives it as breeding "up to 9000 feet" on the east of the range, and we found it common at Glorieta July 8 and on the open mesa at 10,300 feet, where we found a nest in an aspen on July 25. At the same time families of young and old were going about together up at 11,000 feet. By August 5, numbers of Bluebirds, with Flickers, Chipping Sparrows, and Juncos were wandering about in families, the woods as well as the meadows being filled with birds. On August 11 we found a flock of the Bluebirds with Chipping Sparrows and Flickers at 12,300 feet, on a protected slope in the dwarf evergreens of timberline on the south side of Truchas.

THE ORIGIN AND DISTRIBUTION OF THE CHESTNUT-BACKED CHICKADEE.

BY JOSEPH GRINNELL.

THE Chestnut-backed Chickadee (*Parus rufescens*) is a boreal species of peculiarly limited distribution. It is almost exclusively confined to the humid Pacific Coast region of North America, within which it is the most abundant, and in many places the only, member of the genus *Parus* present. We find it characteristically at home within the densest coniferous forests, or along their edges, where there is much shade and an even temperature.

The range of the Chestnut-backed Chickadee is nearly two thousand miles long north and south, extending from a little north of Sitka, Alaska, to some forty miles below Monterey, California. (See Map I.) But its width is very narrow, only within the confines of Oregon and Washington exceeding one hundred miles and elsewhere usually much less, save for one or two isolated interior colonies to be mentioned later.

The influences determining this queer-shaped distribution area may be safely assumed to be atmospheric humidity, with associated floral conditions. For this habitat coincides quite accurately with the narrow coastal belt of excessive cloudy weather and rainfall.

The specific character distinguishing *Parus rufescens* from all other American chickadees is the color of the back, which is an intense rusty brown approaching chestnut. It is of common note that the most evident effects of similar climatic conditions on other animals is a corresponding intensification of browns, especially dorsally. We may therefore consider the Chestnut-backed Chickadee, as indicated by its chief specific character, to be a product exclusively of the peculiar isohumic area to which we find it confined.

Parus rufescens, from Sitka to Monterey, has a chestnut-colored back. And from Sitka to Point Arena, between which we find the extremest humidity, another conspicuous character is uniform,—the color of the sides, which are also deep rusty brown. But from Point Arena south to San Francisco Bay (Marin District), these

lateral brown areas suddenly weaken to pale rusty; while from San Francisco south past Monterey (Santa Cruz District), adult birds have the sides pure smoke gray without a trace of rusty. (See Map II.)

The species thus presents geographic variation within itself, and three distinguishable forms have been named, respectively, the Chestnut-sided Chickadee (*Parus rufescens rufescens*), the Marin Chickadee (*Parus rufescens neglectus*), and the Santa Cruz Chickadee (*Parus rufescens barlowi*). But all three subspecies are unmistakably the Chestnut-backed Chickadee (*Parus rufescens*). (For detailed descriptions, distribution and synonymy see beyond.)

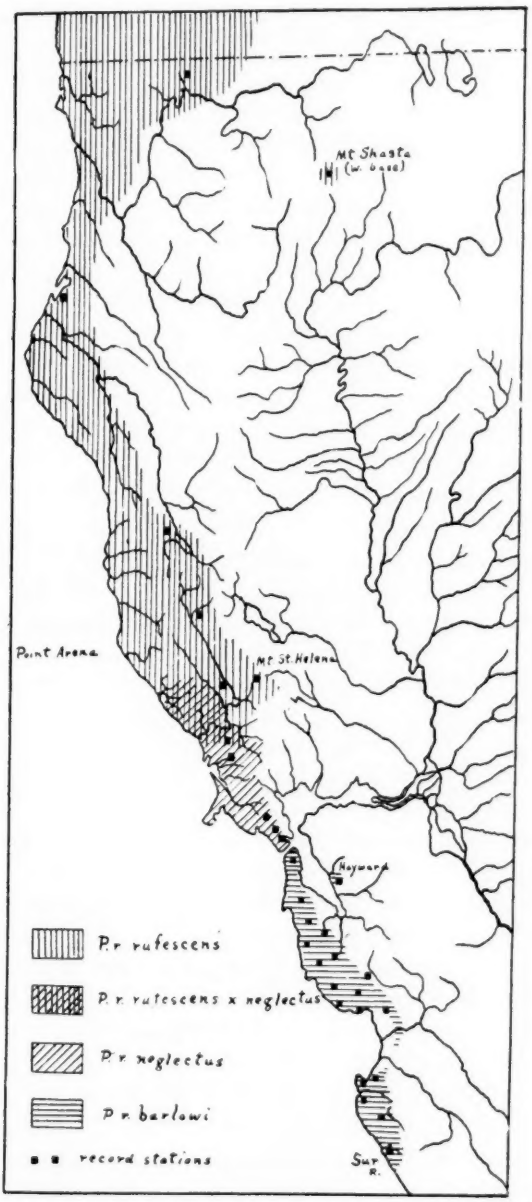
This southward paling of the lateral feather tracts seems to be parallel to the relative decrease in the humidity of the regions occupied. But still, even the Santa Cruz District with its gray-sided *barlowi* has very much greater rainfall and cloudiness than regions immediately to the southward and interiorly. The too abrupt aridification with accompanying sudden floral changes apparently forms the present barrier to further distribution in these directions.

The paling of the sides in the southern bird seems to be a secondary condition, as I hope to show further on by age comparisons. We can reasonably infer that *Parus rufescens rufescens* was the ancestral form from which *Parus rufescens neglectus* and then *Parus rufescens barlowi* successively arose through exodus distally from its point of differentiation further north, where the faunal conditions were doubtless then as now most effective.

First, as to the origin of the species, *Parus rufescens*. Can we find a chickadee now occupying a faunal area which can be considered as nearer the common ancestral form than *rufescens* now is?

An affirmative answer seems plausible when we come to consider *Parus hudsonicus*, which occupies the interior of Alaska and British Columbia east to Labrador and Nova Scotia. This wide-ranging boreal species also affects coniferous forests, and according to my own experience possesses life habits quite similar to those of *Parus rufescens*; in fact to me indistinguishable. The latter differs from *Parus hudsonicus* in smaller size and particularly in shortness of tail. The color areas on the two species are coextensive, but the colors themselves are different in intensity. The top of the

MAP I.
(Dotted area = range of *Parus rufescens*.)



MAP II. RANGES IN CALIFORNIA OF THE RACES OF *PARUS RUFESCENS*.

head in *hudsonicus* is broccoli brown, while in *rufescens* it is dark hair brown. The back of *hudsonicus* is pale grayish olive brown, while in *rufescens* it is chestnut brown. The sides and flanks of *hudsonicus* are rather pale hazel brown, while in *rufescens* they are deep hazel brown approaching chestnut. Otherwise the two species look practically alike.

These differences are just those we find so commonly in two conspecific representatives, one occupying an arid habitat, the other a comparatively more humid one. Indeed we can find exactly parallel cases in certain other bird races occupying the same two regions as the chickadees in question, but which as yet are not disconnected by intermediates, and in which the degree of difference is not so great. (For example, *Melospiza lincolni lincolni* and *Melospiza lincolni striata*, and *Regulus calendula calendula* and *Regulus calendula grinnelli*.) It is the same story, of intensification of browns and decrease in size under the conditions of a moist climate.

As to the greater relative decrease in length of tail in *rufescens*, it may be suggested that it is an observed rule among the Paridæ (and in some other birds of similar habits, though not without exception) that those species which habitually forage highest above the ground in the foliage of tall trees possess the relatively shortest tails, while conversely those which haunt low thick trees or underbrush exhibit the greatest caudal development. (For example, *Psaltriparus* and *Chamæa*.) These conditions doubtless bear some definite relation to mode of flight. The shorter the flights the slower they are, and therefore the greater must be the tail surface distally in furnishing sufficient opposition to the air to direct or arrest flight. At any rate, *rufescens* haunts much higher and more open trees than *hudsonicus*.

It seems to me reasonable to suppose that *Parus hudsonicus* approaches closely the common ancestral form. Its wide range, which, if we take the Old World *Parus cinctus* of such close resemblance as conspecific, is almost holarctic, favors this idea. At some early period there may have been no representative of *Parus* in the Northwest Coast belt. By a process of invasion of individuals of the hypothetical stock form (which we may call *Parus pre-hudsonicus*) from the adjacent region, and their subsequent

gradual response to the new set of environmental factors, a geographical race became differentiated which might have then been properly called *Parus pre-hudsonicus rufescens.*

Unfortunately this process, which I believe to be constantly going on among all animals, is so slow that its actual operation under natural conditions has so far defied direct observation and measurement during a man's lifetime. But it seems quite logical to consider the natural process identical with that under 'artificial' conditions, where the rate is readily perceptible.

We seem warranted in considering all observed living forms, including 'species,' and completely isolated (insular) as well as intergrading 'races' as just a momentary glimpse, so to speak, of a tree-like branchwork slowly rising through time, some of the limbs ramifying freely and rapidly, others growing slenderly without offshoots, but all advancing continually, though changing in outward appearance at different rates; only we at our brief glance can see but a horizontal section, that is, only the set of *tips* of this otherwise ancestral tree.

Accepting this standpoint as the most reasonable hypothesis yet presented, and moreover not at variance with our facts, I feel justified in judging of the methods of ramification and progress through time from observation of the existing set of 'tips' (= species and subspecies). Among these, from the nature of the case, we should be able to recognize various stages in the process of species formation, and from these judiciously selected steps demonstrate the completed stairway which leads up from the very incipiency of differentiation (as impossible of ultimate detection by us as the vanishing point) to the complete separation of two distinct species. The steps are of course really infinite in number, like the points in a geometrical line; the transition proceeds gradually without a break.

In tracing the hypothetical lines of development of the chickadees, I do not feel guilty of bold speculation; for I am only attempting to express in a selected case what is to me clearly evidenced from a survey of bird races in general.

As has already been asserted, *Parus rufescens* doubtless arose as a geographical race of *Parus pre-hudsonicus.* It is now called a 'species' because intermediates have dropped out; in other

words, the divarication is now wholly complete and there are two separate twigs. The area of intermediate faunal conditions between the humid coast belt and the arid interior region of British Columbia and Alaska is very narrow, consisting, in places personally traversed by me, of but a few miles over a mountain ridge. This very narrowness of the area of faunal mergence probably accounts for the lack of intermediates at the present day between *hudsonicus* and *rufescens*.

The center of distribution of any animal is where the greatest rate of increase is. The greatest rate of reproduction is presumably where the species finds itself best adapted to its environment; and this is also where the death rate is least, unless an enemy rapidly multiplies so as to become a serious check. In a wide-ranging species, or one that is rapidly spreading over a region of varying climatic and associated conditions, sub-centers of distribution will arise at points which prove to be more favorable, in point of food supply and minimum of enemies, than intervening areas. From each of these new centers of distribution there will be a yearly radiating flow of individuals into the adjacent country, so as to escape intra-competition at any one point.

Such centers of distribution will obviously, as time goes on, harbor only locally pure-bred individuals, for foreign individuals will not stem the tide of population from season to season slowly emigrating. This will amount to operative isolation and allow of the time necessary for the impress, by local factors of environment, of incipient characters, which, through cumulative inheritance as the element of time further increases, become to us perceptible and characterize this set of individuals as a geographical race or 'subspecies.'

Let us suppose that descendants from the interior *Parus prehudsonicus* from season to season pushed their way further and further into the primæval coast belt until the latter supported a vigorous colony. The coastal humidity was very likely at that time but slightly greater than that of the interior, having gradually increased through slow shifting of ocean currents or other causes, so that the faunal boundary was not so abrupt and did not then as now constitute a formidable barrier to invasion.

Faunal conditions are without doubt undergoing constant alter-

ation. Endemic animals must adaptively respond or else be exterminated or restricted to the places where faunal change is slowest. The possibility at once presents itself of *Parus pre-hudsonicus* having been already native of the coast before the latter became faunally distinct from the interior. But in either case the original populating of the region must have been through invasion from elsewhere, as effected by shifting climatic conditions.

At any rate a center of distribution must have arisen in the new region of different faunal conditions. Just as quick as the new colony began to reproduce fast enough to furnish a return flow of individuals the immigration of individuals bearing the inherited stock characters from the parent region would be checked. This would mean that the new colony would become a new center of differentiation because of the isolation thus afforded. (As to what brings about the acquisition or change of innate characters, whether by natural selection or some other more direct cause, we need not here try to discuss.)

As the dissemination of individuals to prevent congestion of population will be continually away from the centers of distribution, it follows that the characters newly acquired at the centers where the rate of differentiation is greatest will be constantly carried away from those centers. If the region of intermediate faunal conditions were narrow, as in the present case, individuals bearing the inherited characters impressed by their separate areas of differentiation would from generation to generation invade toward each other until intermediates would be swamped, or there might be an unfit strip left between where neither would flourish. This might be bridged over by hybrids for a while. But the specific characters becoming strengthened by time would make hybridization less and less likely to take place, and there would result the two distinct species as we now know them.

In the case of *Parus rufescens* and *Parus hudsonicus* there seems to be now a narrow hiatus between the two. At least I can find no record of the two species having been found in the same locality. The narrowness of the region of intermediate faunal conditions may therefore be considered as the reason why we do not find connecting links between *hudsonicus* and *rufescens* at the present time. For the amount of difference between these two chicka

dees does not strike me as any greater than, for instance, between *Melospiza cinerea montana* and *Melospiza cinerea rufina*, between which there is continuous distribution and free interosculation. But we cannot expect any two species of birds or other animals to present the same degrees of differentiation in the same length of time or under the same conditions, much less under different conditions. For in no two animals is the physical organization in all respects exactly the same.

In a given aggregation of individuals constituting a new colony a certain amount of time is necessary for the set of environmental factors to become operative in bringing about new inheritable characters to a degree perceptible to us. Then the inherited effects of invasion and crossbreeding from season to season from the adjacent parent center of differentiation will be evidenced less and less, as time elapses, as the distance from this center increases. The offspring of successively further removed unions will, of course, inherit to a less and less degree the distinctive characters of the ancestral stock on one side and more and more of the incipient ones on the other.

If, now, the distance is great enough to permit of the time required for adaptive manifestations to become innate, then we would find new characters making their appearance distally nearest the new center of differentiation. If the distance were too short we would not find new characters showing themselves because they would be constantly crowded down by the influx of the old. The time factor may therefore be reduced by the intervention of an impassable barrier. As an instance we find three (and there are probably two other) insular forms of the Song Sparrow within a limited distance among the Santa Barbara Islands, while through the same distance on the adjacent mainland there is but one. Or in the case of continuous distribution the time element may be comparatively lessened by the great distance between the range limits, and it may be still further decreased as these limits lie in faunal areas of more emphatically different nature. The Horned Larks as well as Song Sparrows furnish us several good examples of the latter two rules.

It is *isolation*, either by barriers or by sufficient distance to more than counterbalance inheritance from the opposite type, that seems

to me to be the absolutely essential condition for the differentiation of two species, at least in birds.

A strong argument in support of this conviction is that we never find two 'subspecies' breeding in the same faunal area, and no two closely similar species, except as can be plainly accounted for by the invasion of one of them from a separate center of differentiation in an adjacent faunal area. An appropriate instance in illustration of the latter is the occurrence together in the Siskiyou Mountains of northern California of the brown *Parus rufescens* of the wet coastal fauna and the gray *Parus gambeli* of the arid Sierran fauna. (See Anderson & Grinnell, Proc. Ac. Nat. Sc. Phila., 1903, p. 13.) The Siskiyou Mountains occupy a line of mergence between the two faunæ, and the two respectively representative chickadees have evidently extended their ranges toward each other until now over this one small area they occupy common ground. Several parallel cases could be cited; their significance seems obvious.

We come now to consider the origin of the races of *Parus rufescens*. In a species of recent arrival into a new region (by invasion from a neighboring faunal area), as it adapts itself better and better to its new surroundings, granted the absence of closely related or sharply competing forms, its numbers will rapidly increase. This means that there will be increased competition within the species itself, on account of limited food supply. The alternative results are either starvation for less vigorous individuals during recurring seasons of unusual food scarcity, or dissemination over a larger area. In a way the first might be considered as beneficial in the long run, as doubtless leading to the elimination of the weaker; such a process evidently does take place to a greater or less degree all the time, and is important for the betterment of the race. But as a matter of observation Nature first resorts to all sorts of devices to ensure the spreading of individuals over all inhabitable regions; in other words, the extremest intra-competition does not ensue until after further dissemination is impossible. In birds we find a trait evidently developed on purpose to bring about scattering of individuals. This is the autumnal 'mad impulse' which occurs just after the complete annual moult, when both birds-of-the-year and adults are in the

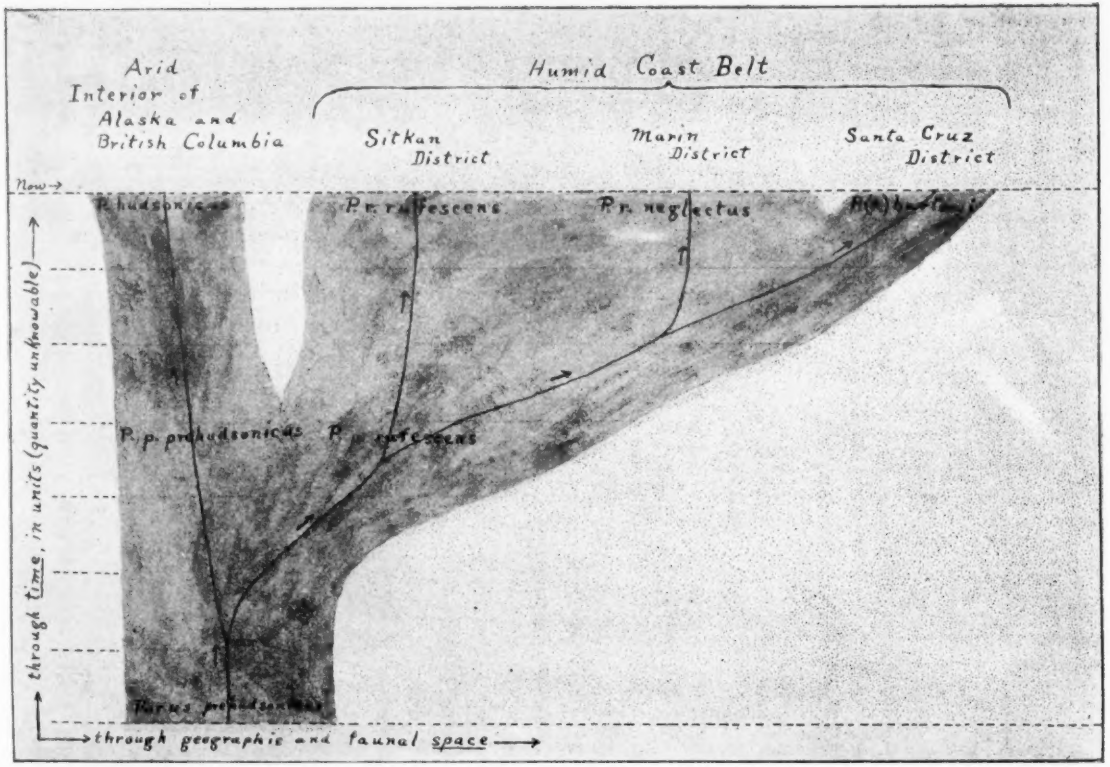
best physical condition, and just before the stress of winter food shortage. Even in the most sedentary of birds, in which no other trace of a migratory instinct is discernible, this fall season of unrest is plainly in evidence. I may suggest not unreasonably that autumnal migration may have had its origin in such a trait as this, the return movement in the spring becoming a necessary sequence. (See Loomis, Proc. Cal. Acad. Sc., 3rd Series, Zoölogy, II, Dec., 1900, 352.) It is a matter of abundant observation that autumn is the season when we find the most unlooked-for stragglers far out of their normal range, and when sober, stay-at-home birds, like *Pipilo crissalis* and the chickadees, wander far from the native haunts where they so closely confine themselves the rest of the year. It is also the experience of collectors that the greatest number of these stragglers are birds-of-the-year, which thus, obeying the 'mad impulse,' are led away from their birthplace into new country, where they may take up their permanent abode, and be less likely to compete with their parents or others of their kind. Then, too, crossbreeding of distantly related individuals is more likely. The records of the Santa Cruz Chickadee outside of its regular breeding range are all of August to October dates (Haywards, Gilroy, San Jose, etc.).

Thus, as above indicated, by the occupancy of new territory the number of individuals which can be supported will correspondingly grow. Hence a vigorous colony will spread out along lines of least resistance, being hindered by slight faunal changes, but completely checked only by topographic or abrupt climatic barriers. *Parus hudsonicus* and its near relative *Parus rufescens* are boreal species, the former inhabiting the Hudsonian Zone and the latter a certain portion of the Canadian. It seems reasonable to suppose that *rufescens* differentiated in the northern part of the humid coast belt, which has been called the Sitkan District. This is a faunal subdivision of the Canadian Zone, and its northern part approximates more closely Hudsonian conditions than southerly. Granting that the early center of differentiation and distribution of *Parus pre-hudsonicus rufescens* was in the northern part of the Sitkan District, then the route of emigration would be confined to the narrow southward extension of that faunal area. The habitat of *Parus rufescens* thus gradually acquired the long north and south

linear appearance as shown at this day. But when the pioneer invaders at the south reached the vicinity of Point Arena, they met with somewhat changed temperature and consequent floral conditions, but not so abrupt as to constitute a permanent barrier. Doubtless the progress of invasion was retarded until adaptive modifications evolved, which correlatively allowed of further invasion, until the abrupt limits of the Santa Cruz District were reached.

San Francisco Bay and the Golden Gate seem to now form a pretty effectual barrier between *neglectus* on the north and *barlowi* on the south. At least, among the large number of skins examined by me with this point in view, I can find none from one side that can be confidently determined as being identical with the race on the other. Neither chickadee has been found east of the bay, nor anywhere nearly so far from the coast belt, except for one record of a specimen taken in the fall at Haywards. This has been reëxamined and proved to be *barlowi*, as was to be expected from its contiguity. However, the Golden Gate is so narrow that an occasional crossing may take place. This was more probable formerly, when the redwood timber grew up to the Gate on both sides. Heermann in 1853 recorded the species from "San Francisco." But now, I think, the bird is unknown for several miles on either side of the Gate. Doubtless this barrier accounts in part for the origin of the distinct form *barlowi* within so short a distance.

As to the distance to which a species may invade, we can surmise that, topography permitting, theoretically there is no limit so long as adaptive modifications continually take place. The geographic variation in *Melospiza* may be called to attention as an extreme illustration. But practically, in the case of *Parus rufescens barlowi*, much further invasion is improbable, because in adjoining areas are already firmly established members of the same family (*Bæolophus*, *Psaltriparus*, *Chamæa*) thoroughly adapted to prevailing food conditions. No one of these could probably be successfully competed against by a foreigner. Every animal tends to increase at a geometric ratio, and is checked only by limit of food supply. It is only by adaptations to different sorts of food, or modes of food getting, that more than one species can occupy the same



MAP III. ROUTES OF DISSEMINATION AND DIFFERENTIATION OF THE *PARUS RUFESCENS*-GROUP OF CHICKADEES.

locality. Two species of approximately the same food habits are not likely to remain long evenly balanced in numbers in the same region. One will crowd out the other; the one longest exposed to local conditions, and hence best fitted, though ever so slightly, will survive, to the exclusion of any less favored would-be invader. However, should some new contingency arise, placing the native species at a disadvantage, such as the introduction of new plants, then there might be a fair chance for a neighboring species to gain a foothold, even ultimately crowding out the native form. For example, several pairs of the Santa Cruz Chickadee have taken up their permanent abode in the coniferous portion of the Arboretum at Stanford University, while the Plain Titmouse prevails in the live oaks of the surrounding valley.

In accordance with the above outlined theories of distribution it is easy to account for isolated breeding colonies, such as that of *Parus rufescens rufescens* in northern Idaho (Fort Sherman and Cœur d'Alene Mountains). Fall stragglers, wandering unusually far and finding themselves suddenly amid familiar conditions, would tarry there to breed, and with the continuance of a favorable state of affairs, and with no serious competition, might soon result in a well-established colony, itself a center of distribution. The record of *rufescens* from Mt. Shasta (July 14) seems to have been based on a lone straggler, for the species has not been found there since. (For references and localities see beyond.)

As has become a generally accepted idea, the young plumages of birds, if different at all from those of the adults, present a generalized type of coloration; or, to express it in another way, the young more nearly resemble recent ancestral conditions. The familiar examples of the spotted, thrush-like plumage of the young robin and the streaked, sparrow-like plumage of young towhees and juncos are cases in point. Accepting this phylogenetic significance of ontogeny, we find the chickadees giving some interesting illustrations.

Although the adult of *barlowi* has the sides pure smoke-gray, the juvenal plumage possesses pale rusty sides. This points towards a rusty sided ancestor like *neglectus*. This also agrees perfectly with the distributional evidence of origin. The adult of *neglectus* has pale rusty sides; the young also has rusty sides, but

somewhat darker than in the corresponding age of *barlowi*, and moreover is more nearly like the juvenal plumage of *rufescens*. But the sides in adult *rufescens* are deep brown, almost chestnut, while the young has much paler, merely dark rusty sides. And what is most significant is that the young of *rufescens* and *hudsonicus* are much nearer alike than are the adults, the former having only very slightly darker rusty on the flanks. The young of *hudsonicus* in respect to intensity of browns almost exactly equal the adults of the same species, showing that the present coloration is of very long standing, and offering further evidence that *hudsonicus* is nearest the common stock form of all the chickadees under consideration. Juvenal characters, resembling ancestral conditions, lag behind the newer acquired adult characters.

To repeat: The young of *barlowi* has the sides paler rusty than *neglectus*, *neglectus* slightly paler than *rufescens*, but *rufescens* has the sides slightly more rusty than *hudsonicus*, a sequence which accords well with the present theories of origin. (See Map III.)

MEASUREMENTS (IN INCHES AND MILLIMETERS) OF THE RACES OF *Parus rufescens*.

		Parus rufescens rufescens.			*Parus rufescens neglectus.*			*Parus rufescens barlowi.*		
			Wing.	Tail.		Wing.	Tail.		Wing.	Tail.
21 ♂♂	max.	2.50 (63)	2.33 (59)	6 ♂♂	max.	2.38 (60)	2.21 (56)	25 ♂♂	max.	2.50 (63)	2.36 (59)
	av.	2.42 (61)	2.18 (56)		av.	2.35 (59)	2.17 (55)		av.	2.42 (61)	2.26 (57)
	min.	2.38 (60)	2.08 (53)		min.	2.30 (58)	2.07 (53)		min.	2.32 (59)	2.19 (56)
11 ♀♀	max.	2.41 (61)	2.21 (56)	5 ♀♀	max.	2.28 (58)	2.16 (55)	10 ♀♀	max.	2.45 (62)	2.24 (57)
	av.	2.28 (58)	2.10 (53)		av.	2.24 (57)	2.12 (54)		av.	2.30 (58)	2.13 (54)
	min.	2.15 (55)	2.03 (52)		min.	2.21 (56)	2.08 (53)		min.	2.22 (56)	2.05 (52)

COMPARATIVE COLORATION[1] OF THE RACES OF *Parus rufescens.*

Parus rufescens rufescens	*Parus rufescens neglectus.*	*Parus rufescens barlowi.*
(♂ ad.; No. 5623, Coll. J. G.; Seiad Valley, Siskiyou Mountains, California; Dec. 12, 1901; collected by M. P. Anderson.)	(♂ ad.; No. 5624, Coll. J. G.; San Geronimo, Marin County, California; Feb. 13, 1902; collected by J. & J. W. Mailliard.)	(♂ ad.; No. 4425, Coll. J. G.; Stevens Creek Cañon, Santa Clara Co., California; Oct. 13, 1900; collected by J. Grinnell. [Type.])
Top of head and hind neck dark seal brown; ocular stripe sooty.	Top of head and hind neck dark seal brown; ocular stripe sooty.	Top of head and hind neck dark seal brown, very slightly paler; ocular stripe sooty.
Mantle chestnut, inclining slightly toward hazel; rump the same.	Mantle chestnut, inclining toward hazel; rump slightly paler.	Mantle chestnut, inclining strongly toward hazel; rump paling to clay color.
Sides of head and neck white, forming a wedge-shaped patch from bill to shoulder.	Sides of head and neck white, forming a wedge-shaped patch from bill to shoulder.	Sides of head and neck white, forming a wedge-shaped patch from bill to shoulder.
Chin and throat dark seal brown.	Chin and throat dark seal brown, very slightly paler.	Chin and throat dark seal brown, very slightly paler.
Sides and flanks chestnut, inclining slightly toward hazel.	Sides and flanks pale hazel.	Sides and flanks pure smoke gray.
Wings and tail fuscous, pale-edged.	Wings and tail fuscous, pale-edged.	Wings and tail fuscous, pale-edged.
(♂ juv.; No. 1194, Coll. J. G.; Sitka, Alaska; June 26, 1896; collected by J. Grinnell.)	(♂ juv.; No. 5625, Coll. J. G.; San Geronimo, Marin Co., Cal.; June 30, 1903; J. & J. W. Mailliard.)	(♂ juv.; No. 4684, Coll. J. G.; Palo Alto, Santa Clara Co., Cal.; May 11, 1901; collected by J. Grinnell.)
Similar to adult, but:	Similar to adult, but:	Similar to adult, but:
Top of head and hind neck dark hair brown.	Top of head and hind neck dark hair brown.	Top of head and hind neck dark hair brown.
Mantle burnt umber; rump inclining toward hazel.	Mantle dull burnt umber; rump slightly paler.	Mantle pale burnt umber, merging into pure hazel on the rump.
Chin and throat dull seal brown.	Chin and throat dull seal brown.	Chin and throat dull seal brown.
Sides and flanks dark hazel.	Sides and flanks pale hazel.	Sides and flanks very pale tawny.

[1] Color names taken from Ridgway's 'Nomenclature of Colors.'

LOCALITIES OF OCCURRENCE.

Parus rufescens rufescens.

Specimens examined.— Sitka, Alaska. British Columbia: Mt. Lehman; North Saavich, Vancouver Id. Fort Canby, Wash. Oregon: Cedar Mill, Washington Co.; Salem; Butteville; Upper Klamath Lake. California: Siskiyou Mts.; Eureka; Healdsburg; Mt. St. Helena.

Other stations (mostly from published records). — Alaska: Juneau; Portage Bay; Lituya Bay; Haines; Skaguay; Glacier. Queen Charlotte Ids., B. C. Washington: Seattle; Ft. Steilacoom; Ft. Vancouver; Gray's Harbor; Cape Disappointment; Stehekine Valley, Okanogan Co. Idaho: Cœur d'Alene Mts.; Ft. Sherman. Oregon: Wilbur; Yakina Bay; Dayton; Sheridan; Portland; Corvallis; Clatsop Co. California: Cahto, Mendocino Co.; west base Mt. Shasta.

Parus rufescens neglectus.

Specimens examined (all from California).— Marin County: San Geronimo; Nicasio; Fairfax. Sonoma County: Sebastopol (intermediate, toward *rufescens*); Cazadero (intermediate, toward *rufescens*).

Record station.— Ukiah, Mendocino Co.

Parus rufescens barlowi.

Specimens examined (all from California).— San Mateo County: San Mateo; King Mt.; Woodside; Pescadero Cr.; La Honda. Santa Clara County: Palo Alto; Stanford University; Stevens Creek Cañon; Gilroy. Alameda County: Haywards; Alvarado. Monterey County: Monterey; Pacific Grove; Carmel Bay.

Other stations (from published records).— San Francisco. Santa Cruz County: Boulder Creek; Santa Cruz; Saratoga; Watsonville. Little Sur River, Monterey Co.

SYNONYMY.

Parus rufescens rufescens.

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Ibis, 2nd Ser. IV, Oct. 1868, 421 (Vancouver Id.).— GRAY, Hand-list Bds. I, 1869, 232 ("*sitchensis*, Kittl.").— COOPER, Am. Nat. III, April 1869, 75 ("dense forests of the higher Cœur d'Alene Mountains").— DALL & BANNISTER, Trans. Chicago Ac. Sc. I, 1869, 280 (Sitka).— COOPER, Orn. Cal. I, 1870, 47, part.— COUES, Key, 1872, 81.— COUES, Bds. Northwest, 1874, 22.— BAIRD, BREWER & RIDGWAY, Hist. N. Am. Bds. I, 1874, 104.— RIDGWAY, Proc. U. S. N. M. I, March 1879, 395.— RIDGWAY, Proc. U. S. N. M. I, May 1879, 486 (synonymy).— HENSHAW, Rep. Wheeler Surv. 1879, 288.— RIDGWAY, Proc. U. S. N. M. III, Aug. 1880, 169.— GADOW, Cat. Bds. British Mus. VIII, 1883, 34, part (Upper Klamath Lake; etc.).— HARTLAUB, Journ. für Orn. XXI, July 1883, 266 (Portage Bay, Alaska, Dec.–Feb.).— ANTHONY, Auk, III, April 1886, 171 (Washington Co., Oregon, breeding).— NELSON, Rep. Nat. Hist. Coll. Alaska, 1887, 214 (Lituya Bay; etc.).— TOWNSEND, Proc. U. S. N. M. X, 1887, 229 (coast of Humboldt Co.; Mt. Shasta, west base, 1 spec, July 14).— COUES, Key, 1890, 267.— BELDING, Land Bds. Pac. Dist. Sept. 1890, 242 (Wilbur, Oregon; etc.).— CHAPMAN, Bull. Am. Mus. Nat. Hist. III, Sept. 1890, 153 (coast of British Columbia).— SWALLOW, Auk, VIII, Oct. 1891, 397 (Clatsop Co., Oregon).— LAWRENCE, Auk, IX, Jan. 1892, 47 (Gray's Harbor, Wash.).— RHOADS, Proc. Ac. Nat. Sc. Phil., 1893, 58.— MCGREGOR, Nidologist, IV, Sept. 1896, 8 (Cahto, Mendocino Co., Cal.).— MERRILL, Auk, XV, Jan. 1898, 21 (Ft. Sherman, Idaho, resident; specimens, according to Brewster, identical in every respect with skins from coast of British Columbia).— GRINNELL, Auk, XV, April 1898, 130 (Sitka, Alaska, breeding).— KOBBÉ, Bull. Cooper Orn. Club, I, Sept. 1899, 84 (Cape Disappointment, Wash., nesting habits; etc.).— MERRIAM, N. Am. Fauna No. 16, Oct. 1899, 132.— KOBBÉ, Auk, XVII, Oct. 1900, 357.— BISHOP, N. Am. Fauna No. 19, Oct. 1900, 93 (Alaska: Haines, Skaguay, and Glacier).— GRINNELL, Condor, II, Nov. 1900, 127.— FISHER, Condor, II, Nov. 1900, 138 (Mt. St. Helena).— FISHER, Condor, III, July 1901, 91.— DAWSON, Auk, XVIII, Oct. 1901, 403 (Stehekine Valley, Okanogan Co., Wash.).— OSGOOD, N. Am. Fauna No. 21, 1901, 50 (Queen Charlotte Ids., B. C.).— WOODCOCK, Bull. 68, Oregon Agr. Exp. Sta., Jan. 1902, 93 (Oregon: Yakina Bay; Dayton; Sheridan; Salem; Portland; Corvallis).— RATHBUN, Auk, XIX, April 1902, 140 (Seattle, Wash., breeding).— FISHER, Condor, IV, Nov. 1902, 135.— BAILEY, Handbook Bds., Nov. 1902, 459.

Pœcila rufescens BONAPARTE, Conspectus Avium, I, 1850, 230.

Parus rufescens rufescens GRINNELL, Pac. Coast Avif. No. 3, June 1902, 71.— ANDERSON & GRINNELL, Proc. Ac. Nat. Sc. Phil., Jan. 1903, 13 (Siskiyou Mts., Cal.).

Parus rufescens neglectus.

Parus rufescens BREWSTER, Bull. Nutt. Orn. Club, III, Jan. 1878, 20 (Nicasio).

Parus rufescens, β. *neglectus* RIDGWAY, Proc. U. S. N. M. I, May 1879, 485 (orig. descr.; type locality not indicated, but later determined to be Nicasio).

Parus rufescens neglectus ALLEN, Bull. Nutt. Orn. Club, V, April 1880, 89.— RIDGWAY, Proc. U. S. N. M. III, Sept. 1880, 169, 215.— A. O. U. Checklist, 1886, 336, part ?.— RIDGWAY, Man. N. Am. Bds., 1887, 564, part.— BELDING, Land Bds. Pac. Dist., Sept. 1890, 242, part (Ukiah; Sebastopol; etc.).— COUES, Key, 1890, 267, part ?.— MAILLIARD, Condor, II, May 1900, 67 (Marin County).— GRINNELL, Condor, II, Nov. 1900, 127.— GRINNELL, Pac. Coast Avif. No. 3, June 1902, 71.

Parus rufescens barlowi.

Parus rufescens NUTTALL Man. Orn. I, 1840, 268, part ("Upper California").— GAMBEL, Proc. Ac. Nat. Sc. Phil., Feb. 1847, 155 (Monterey).— GAMBEL, Journ. Ac. Nat. Sc. Phil., 2nd Ser. I, Dec. 1847, 36.— HEERMANN, Journ. Ac. Nat. Sc. Phil., 2nd Ser. II, Jan. 1853, 264 (San Francisco, breeding).—BAIRD, Pac. R. R. Rep. IX, 1858, 394, part.—HEERMANN, Pac. R. R. Rep. X, 1859, 42.— COOPER, Pac. R. R. Rep. XII, 1860, 194, part.— BAIRD, Rev. Am. Bds., Aug. 1864, 83, part.— COOPER, Orn. Cal. I, 1870, 47, part.— BAIRD, BREWER & RIDGWAY, Hist. N. Am. Bds. I, 1874, 104; III, 502, part (Santa Cruz, breeding).— GADOW, Cat. Bds. VIII, 1883, 34, part.

Parus rufescens neglectus SKIRM, Orn. & Ool. IX, Dec. 1884, 149 (Santa Cruz).— RIDGWAY, Man. N. Am. Bds. 1887, 564, part.— DAVIE, Nests and Eggs N. Am. Bds. 4th Ed., 1889, 421.— BELDING, Land Bds. Pac. Dist. Sept. 1890, 242, part.— FISHER, N. Am. Fauna No. 7, May 1893, 140 (Boulder Creek, Santa Cruz County).— A. O. U. Checklist, 2nd Ed., 1895, 310, part ?.— VAN DENBURGH, Proc. Ac. Nat. Sc. Phil., April 1898, 218 (Santa Cruz County: Saratoga to Boulder; Watsonville).— VAN DENBURGH, Proc. Am. Philos. Soc. XXXVIII, Nov. 1899, 178 (Palo Alto). EMERSON, Condor, II, Jan. 1900, 19 (Haywards).— RAY, Osprey, V, Oct. 1900, 7 (Little Sur R., Monterey Co.).— BAILEY, Handbook Bds., Nov. 1902, 459, part ?.

Parus rufescens barlowi GRINNELL, Condor II, Nov. 1900, 127 (orig. descr.; type from Stevens Creek Cañon, Santa Clara Co., Cal.).— ALLEN, Auk, XVIII, April 1901, 178.— MCGREGOR, Pac. Coast Avif. No. 2, May 1901, 20.— GRINNELL, Pac. Coast Avif. No. 3, June 1902, 71.— FISHER, Bailey's Handbook Bds., Nov. 1902, lvi (Santa Cruz Mts.).— A. O. U. COMMITTEE, 12th Sup., Auk, XX, July 1903, 359.— ANDERSON & JENKINS, Condor, V, Nov. 1903, 155 (La Honda, San Mateo Co.).

Parus barlowi GRINNELL, Condor, IV, Nov. 1902, 127 (Little Sur R., Monterey Co.).

BLACK-CAPPED PETREL.
Taken at Pittsfield, N. H., Aug. 30, 1896.

GENERAL NOTES.

Black-capped Petrel in New Hampshire.— Recently Mr. Henry W. Osgood sent me a photograph (see Plate XXII) of a Black-capped Petrel (*Æstrelata hasitata*) taken at Pittsfield, N. H., August 30, 1893, but not hitherto recorded.[1] The locality of capture is forty miles from the sea. The specimen was a male, and fell, in an exhausted condition, near Mr. Osgood's home. Its stomach was empty. This is the first record of the species for New Hampshire, though previously reported from Vermont.

This straggler from tropical seas has the following North American records: (1) Near Indian River, Florida, winter of 1846 (Lawrence, Ann. Lyc. Nat. Hist. New York, IV, p. 475). (2) Quoque, Long Island, N. Y., July, 1850 (Lawrence, Ann. Lyc. Nat. Hist. New York, V, 1852, p. 220). (3) Blacksburg, Va., Aug. 30, 1893 (Smyth, Auk, X, 1893, p. 361). (4) Oneida Lake, N. Y., Aug. 28, 1893 (Bagg, Auk, XI, 1894, 162). (5) Toronto, Canada, Oct. 30, 1893 (McIlwraith, Birds of Ontario, 1894, p. 414). (6) Vermont, place and date not recorded (Allen, Auk, XI, 1894, p. 241). (7) New Paltz, Ulster Co., N. Y., Jan. 26, 1895 (Foster, Auk, XII, 1895, p. 179). (8) Cincinnati, Ohio (two specimens), Oct. 5, 1898 (Lindahl, Auk, XVI, 1899, p. 75). (9) Augusta, Ky., Oct. 4, 1898 (Lindahl, Auk, XVI, 1899, p. 75). (10) The New Hampshire specimen recorded above — ten records, eleven specimens.— J. A. ALLEN, *Am. Mus. Nat. Hist., New York City.*

Holbœll's Grebe in Lancaster, Mass. — A live Holbœll's Grebe (*Colymbus holbœllii*), a young male, was found in Lancaster, Mass., February 15, 1904, by one of the local sportsmen and given to me. It did not seem injured in the least, and lived in confinement for nine days. It was found in a marshy meadow near the main street, near several houses. — JOHN E. THAYER, *Lancaster, Mass.*

European Widgeon in Southern California. — A male European Wid-

[1] Since this note was sent to the printer I have received a copy of Mr. Glover M. Allen's 'A list of the Birds of New Hampshire' (Proc. Manchester Institute of Arts and Sciences, IV, Pt. 1, pp. 23–222), in which (p. 69) occurs the following: "A single specimen was captured at Pittsfield, in Merrimack County, in August, 1893, and beyond an anonymous paragraph in the Boston Sunday Herald ('93), appears not to have been recorded. The bird is now in the mounted collection of Mr. William Brewster, No. 46,076, catalogued under date of August 30, 1893. Doubtless the bird was blown up the coast by the tropical hurricane of the last week of August in that year," with also Nos. 3, 4, and 6 of the above list.

In a letter just received Mr. Osgood confirms Mr. Allen's statement that the New Hampshire specimen, recorded above, is now in Mr. Brewster's collection.

geon (*Mareca penelope*) was shot by C. H. Mears, February 16, 1904, on the Pasadena Duck Club preserves at Bixby, Los Angeles County, California. The specimen is now owned by Joseph Welsh of Pasadena, who kindly turned it over to me for examination and permitted the present record. The bird is in full plumage, and closely resembles the usual male Baldpate in all respects except the head and neck, which are almost uniform chestnut in color. The top of the head, from base of upper mandible to occiput, is plain white, slightly rusty anteriorly. The throat is largely blackish, while minute arrowheads of black dot the cheeks and loral regions. Back of the eye the chestnut ground color is overlaid by numerous flecks of metallic green. This bird was a novelty to local sportsmen, who at first took it for a hybrid of some sort. "Redhead × Baldpate" was suggested. — JOSEPH GRINNELL, *Pasadena, Cal.*

On the Evanescent Ground-tint of Woodcock's Eggs. — My dog stood a Woodcock (*Philohela minor*) on its nest, containing four perfectly fresh eggs, April 10th of this year. The peculiarity of these eggs was their very dark coloration, the ground tint being slightly darker even than the dead oak leaves that surrounded and composed the nest. On comparing the eggs the next day with the series in the U. S. National Museum, in conjunction with Dr. Ralph, we could find no eggs that were anywhere near as dark; in fact, they were darker even than the darkest eggs of *Gallinago delicata*, and we were congratulating ourselves on adding an unique set to the collection, when after a week's duration, in moth-proof museum cases, one egg faded out to the usual Woodcock ground tint, followed in a day or so by the other eggs. Now I would like to ask the readers of 'The Auk' if freshly laid eggs of the Woodcock are always so dark, fading out during incubation or without it? — J. H. RILEY, *Washington, D. C.*

How an Abnormal Growth of Bill was Caused. — The articles by Mr. B. S. Bowdish and Mr. P. A. Taverner in the last two numbers of 'The Auk' on abnormal bills call to mind an incident that happened several years ago and resulted in a somewhat similar growth.

A young friend of mine took an acquaintance to visit a Flicker's (*Colaptes auratus*) nest which he had discovered. The nestlings were then only two or three days old. The boy put his hand into the nesting cavity and lifted out one of the young birds by the bill. In so doing he somehow twisted the mandibles. On another visit to the nest the young birds were found to be well feathered and almost ready to shift for themselves. The injured bill had grown in the twisted shape and the mandibles were now crossed very similar to those of the Crossbill (*Loxia curvirostra minor*). The bird was otherwise in as good condition as the others, but of course the parents were still feeding them, and the specimen was not seen after leaving the nest. — CHRESWELL J. HUNT, *Philadelphia, Pa.*

The Evening Grosbeak in Central New York in April. — On April 11 a neighbor described to me two birds which she had seen in the fruit trees in her yard so accurately that I had no doubt that she had seen a pair of Evening Grosbeaks (*Hesperiphona vespertina*). A later search failed to reveal them that day, however, but on the following day I was sent for, and on nearing the place heard their curious notes, and had no difficulty in finding the birds. They were quite tame, and I watched them for a long time. They spent most of the time on the ground or in the lower branches of the trees, and the male in particular seemed very partial to the shriveled and discolored apples that lay on the ground or clung to the branches. Whether he ate the pulp or the seeds I could not tell positively.

In the winter of 1901–02 these birds were quite common here, but I have since had no report of them until the present instance, and I was surprised to see them here this year after the spring had broken and all the early birds were starting their nesting. — Louis Agassiz Fuertes, *Ithaca, N. Y.*

The Evening Grosbeak at Beverly, Mass.—In the winter of 1889–1890 there was a great incursion of the Evening Grosbeak (*Hesperiphona vespertina*) to Massachusetts, a number of specimens being taken at Boxford and Lynn. This was considered the most interesting flight of birds ever recorded in the State. Most of the specimens secured were placed in the Peabody Academy of Science at Salem. I believe the species has not been seen since then until Wednesday, March 23, 1904, when I came upon a flock of five of them. They were in a willow tree along with some Robins and Rusty Grackles. The Robins and Grackles flew when I passed under the tree, but these birds remained, and to my surprise I discovered that they were the Evening Grosbeak. They were much scattered, and I fired at one old male which I secured. They flew perhaps an eighth of a mile before alighting again. I followed and secured two more, a young male and a female. They were all fine birds, in good condition, and their stomachs were well filled with buds and seed. They have been purchased by Mr. John E. Thayer of Lancaster, Mass.; two of them will be placed in the collection of the Boston Society of Natural History and the other retained for his own collection. — C. Emerson Brown, *Beverly, Mass.*

Nelson's Sharp-tailed Sparrow in North Dakota — On June 12, 1902, while dragging with a long rope, over low prairie land near a small slough, I flushed a little sparrow from a heavy tangled growth of grass. The spot was marked and upon returning an hour later the bird was again started from the grass nearby. A careful search ended fruitlessly; I then retired a short distance and waited about fifteen minutes. The next time I approached the spot on a run and the bird fluttered from the grass at my very feet, only to drop into the grass a few yards away, as she

had done before. I began searching over every inch of ground and after half an hour's work I found a tiny nest sunken on a level with the ground, which was so well concealed by its small size and the thick clump of grass in which it was located that I could not remove my eyes without again having to search for it. The structure was four inches in depth and well arched over at the top, resembling nothing more than a tiny burrow; so dark was the interior of the nest that the eggs could not be discerned until the surrounding growth had been displaced. This nest was composed of fine grasses, very compactly woven, and the walls were thick and strong. Incubation was far advanced in the five eggs which it contained, the ground color of which was grayish white thickly and uniformly marked with specks of light brown.

I found it no easy matter to obtain the bird, as it never flew for more than a few yards without dropping into the grass, and only took wing when almost trampled upon. At last, however, I secured the bird with a snap shot when it took a longer flight than usual. The bird proved beyond all question to belong to *Ammodramus nelsoni*, and the bird, nest and eggs are now in the collection of Dr. H. B. Bishop. Few sets, if any, of this sparrow have been taken within the limits of the United States, though Arnold and Raine have taken sets in Canada. The set described above was taken near Devils Lake City, N. D. — CHARLES W. BOWNAN, *Devils Lake, N. D.*

Henslow's Sparrow in Chester County, Pa.— On April 25, 1904, I shot a male Henslow's Sparrow (*Ammodramus henslowii*) at Cupola, Chester Co., Pa. There were some six pairs of these sparrows in an overgrown, upland field. They ran under the matted grass like meadow mice and it was almost impossible to flush them, but their weak, two-syllabled notes could be heard on every side. On another visit to the locality, on May 8, only a single bird was seen and on May 22 they seemed to have entirely deserted the spot, as none were to be found.— CHRESWELL J. HUNT, *Philadelphia, Pa.*

Henslow's Sparrow at Bethlehem, Pa. — A Correction. — In view of the recent occurrences of Henslow's Sparrow (*Ammodramus henslowii*) in New Jersey and Pennsylvania, it seems desirable to call attention to an erroneous record furnished to Dr. B. H. Warren and first published in his Birds of Pennsylvania.' On p. 236 he says: "Nests have been taken in our state by Dr. Detwiller of Bethlehem and Mr. Roddy of Millersville." In my 'Birds of Eastern Pennsylvania and New Jersey,' after corresponding with both gentlemen, I published more explicit data concerning the dates and localities of these nests.

Subsequently a portion of the late Dr. Detwiller's collection came into possession of the Academy of Natural Sciences, and among other specimens are two birds labeled "*Coturniculus henslowi*, Bethlehem, June,

1883, shot after procuring three sets of eggs." Further comment is hardly necessary when I state that both birds are Baird's Sparrow (*Coturniculus bairdii*), the "male" being an adult, the "female" a juvenal specimen. From the peculiar make-up of the skins I have no hesitation in saying that they were taken by Mr. Krider on a trip which he took to North Dakota with Dr. W. L. Abbott in 1881. Dr. Detwiller obtained many specimens from Krider. — WITMER STONE, *Academy of Natural Sciences, Philadelphia, Pa.*

What has happened to the Martins? — Last summer the Martins (*Progne subis*) were suddenly either destroyed or driven away from their boxes in this town where for many years they have been domiciled. I watched interestedly for their arrival this spring, and was delighted on May 8, 1904, to see one about their old homes; but my delight has been short-lived, as the one lone bird disappeared and no others have come. Does it mean that the largest Concord colony I know of, where for many years at least fifteen pairs have nested, is wiped out? I would like to know if other New England towns have so mysteriously lost their Martins. — REGINALD HEBER HOWE, JR., *Concord, Mass.*

Breeding of Lawrence Warbler in New York City. — It is with pleasure that I am able to place on record some notes of the breeding of Lawrence Warbler (*Helminthophila lawrencei*). This is, I believe, the twelfth individual of this species to be recorded, and the first instance of its breeding, the other eleven birds being migrants.

The discovery of the nest was first made by Dr. Wiegmann early in June of the present year, and many of the following notes are from his observations.

Occurrence. — On May 15, 1903, Dr. Wiegmann observed a Lawrence Warbler in the New York Zoölogical Park, and on June 6 of last year I made a note of this species in my journal, but the glimpse I had of the bird was so brief that I then recorded the identification as not sufficiently certain for publication. The bird was first observed in the Park on May 18 of this year, and almost every day thereafter until June 16.

Plumage. — The individual Lawrence Warbler under consideration was exactly like the type specimen of Herrick as described in Ridgway's 'Birds of North and Middle America' (U. S. Nat. Mus. Bull. No. 50, Part II, p. 452) except that the gular patch of black extended over the entire chin. The bird was in finest plumage, the markings of the throat and lores being jet black. The wing bars were white with just a tinge of yellow when seen in a favorable light at short range.

Habitat. — The bird's breeding place in the Zoölogical Park was in an open hardwood growth, near one of the Society's buildings, hardly a stone's throw from the Bird House.

Song. — This resembled very closely the dreamy *zree-e-e, zwee-e-e-e* of the Blue-winged Warbler (*H. pinus*). An acute ear, however, could

detect that the first phrase was a typical *chrysoptera* syllable, while the second was a perfect *pinus* syllable, thus: *shree-e-e, zwee-e-e-e*, the first syllable penetrating and somewhat harsh, the second long-drawn, dreamy and wheezy.

Habits.— Very similar to *pinus*. The male Lawrence Warbler was mated with a typical female Blue-winged Warbler. The nest was placed on the ground among a thick layer of dead leaves, and was arched over and almost concealed from view by sweet-brier vines. It was a well-made cup of dried leaves lined with strips of cedar bark. On June 13 there were six vigorous young birds in the nest, all in the typical nestling plumage of *H. pinus*, showing no traces of the black markings of *H. lawrencei*. Within five minutes after our arrival, both parents appeared, carrying mouthfuls of green cut-worms. The birds were very tame, allowing us to approach within eight feet without showing fear. At other times the birds were within a yard of the observer. Both parents kept up the sharp chips of warning to the young. The young birds left the nest in safety on June 16, and though search has been since made, they have not again been observed.

It is hoped that this interesting and rare species, whether it be a hybrid or, as I half suspect, a species in the process of making, will make the Zoölogical Park its home for a third year. It has seemed to us that when the identification is as certain as in this instance, the interests of science may best be served by permitting the bird to breed unmolested, rather than by simply adding a twelfth skin to our collections, and by so doing, put an end to all hope of future observations of the bird or its offspring. I wish that ornithologists would do likewise more often in the case of extra-limital records of species where the identification of the living bird is certain.— C. William Beebe, *Curator of Ornithology, New York Zoölogical Park.*

Myrtle Warblers Wintering in Maine.— Several years ago there was some comment in 'The Auk' with reference to a claim that Myrtle Warblers had been found wintering in this State. Under title of 'The Yellow-rumped Warbler Wintering in Maine,' Dr. Joseph L. Goodale reported the capture of two of these birds from a flock of six at Pine Point, Me., Jan. 1, 1885 (Auk, Vol. II, p. 216). Mr. Nathan Clifford Brown later expressed a doubt that these Pine Point birds tarried in Maine throughout the season, implying that it was a time of unusually severe cold (Auk, Vol. II, p. 307).

I am now able to establish by reliable evidence the wintering in Maine the past winter of a flock of three to six Myrtle Warblers. The season, it should be remembered, was more severe than usual, the thermometer being near the zero mark morning after morning through January, when the birds were found. Jan. 10, 1904, I walked to Pond Cove, Cape Elizabeth, the snow being about two feet deep and the day severely cold. There I saw several birds flying about the trees near the road, but I did

not at that time succeed in fully identifying them, the snow being deep and I was not suitably dressed for wading. Jan. 17, 1904, equipped for any depth of snow, I went to the same locality for the purpose of ascertaining if possible what the birds were. They were found in the same general locality and identified fully as Myrtle Warblers. I saw three at that time. They were living in the edge of evergreen woods and were found feeding on a weedy slope a hundred feet from the shore of Casco Bay. The principal growth here was the bayberry or wax myrtle, and the birds were observed feeding in these bushes. Jan. 24, 1904, I took with me to the place J. F. Fanning, Esq., and J. W. Leathers, Esq., of Portland, both members of the Maine Ornithological Society and both experienced observers. The identity of the Myrtle Warblers was fully confirmed by them. Three and perhaps four of the birds were seen at this time. Jan. 31, 1904, I took with me Mr. Leathers and Mr. Arthur H. Norton, of Westbrook, the latter the leading ornithologist of this locality, whose contributions to 'The Auk' are familiar to all its readers. The birds were again fully identified and it was made almost certain that there were four in the flock. Feb. 7, 1904, I again visited the place and found the birds still there, but could not count more than three. Feb. 14, 1904, in company with Mr. Fanning and Mr. Leathers, I saw one Myrtle Warbler at Cumberland, fully ten miles from Pond Cove. This one was near a large growth of wax myrtle bushes. I did not visit Pond Cove again until Feb. 28, 1904. At this time it was raining and no Myrtle Warblers were seen. March 6, 1904, I was again at Pond Cove but saw no warblers. March 13, 1904, Mr. Fanning, Mr. Leathers and I visited Pond Cove and found the Myrtle Warblers in the same place as on previous visits. This time six of them were seen in the air at the same time, as they flew up from the wax myrtle bushes at our approach, and were again identified beyond a doubt by all three of us.

Two Robins wintered in this same locality, being seen on four or five visits through January to March. A Song Sparrow was also seen here in January and one on March 13. All these birds apparently found plenty of food during the very cold weather and all thrived on the fare they secured from the sunny slope on which they spent the greater part of the time.

The winter was the severest for at least twenty-five years, as evidenced by the freezing of the whole of Casco Bay inside the islands. From 300 to 500 Black Ducks were driven into the inner harbor by the closing of their usual feeding grounds among the islands. They congregated near Martin's Point bridge on the Falmouth shore and for several weeks staid within two hundred yards of the bridge, flying up at the approach of the electric cars which cross the bridge every fifteen minutes. They suffered to some extent for food, and corn and other things were thrown on the flats for them by kind-hearted persons, who thought the birds were liable to starve. Not one of them died, as a matter of fact, except a few whose death was doubtless due to flying against the wires which pass over the

bridge. They staid until the ice began to leave the bay, objects of great curiosity to hundreds of persons who went there for the purpose of seeing so unusual a sight.— W. H. BROWNSON, *Portland, Me.*

Phyllopseustes versus Phylloscopus. — In a recent connection (Hand List Gen. and Spec. Birds, IV, 1903, p. 358), Dr. Sharpe very properly calls attention to the fact that *Phyllopseustes* is untenable as the generic name of the group of willow (or leaf) warblers to which it has been more or less frequently applied. The proper designation is *Phylloscopus* Boie (Isis, 1826, p. 972), as Dr. Sharpe has shown (*loc. cit.*), for in both the supposed earlier references to *Phyllopseustes*, or *Phyllopseuste* (Meyer, Vög. Liv. u. Esthlands, 1815, p. 122; *ibid.*, Taschenb. Deutsch. Vögel, III, 1822, p. 95), the name is employed not in a generic sense but as a plural group heading, and is spelled "*Phyllopseustæ*." The generic name *Phyllopseustes*, however, has for long stood in the American Ornithologists' Union Check-List; and the present writer, in suggesting to Dr. Sharpe the propriety of using this name in place of *Phylloscopus*, did so without considering the necessity of verifying the original reference, but relying upon the presumed correctness of the Check-List. Now, however, the ghost of *Phyllopseustes* having been finally laid, *Phylloscopus* may rest undismayed in possession of its own.

The only willow warbler occurring in North America — *Phyllopseustes borealis* (Blasius) of the A. O. U. Check-List (1895, p. 313) — is, as many authors have contended, generically different from *Phylloscopus*, and should be called *Acanthopneuste borealis* (Blasius). — HARRY C. OBERHOLSER, *Washington, D. C.*

Peculiar Nesting-site of the Bluebird in the Bermudas.— On June 28, 1903, I found a Bluebird (*Sialia sialis*) at Hungary Bay in Bermuda. Unlike any that I had ever seen, it was built of grass and weeds, rather bulky, and placed on the branch of a cedar tree about fifteen feet from the ground, and several feet out from the trunk of the tree. It contained one fresh egg which undoubtedly belonged to a second set. Both birds were present and showed considerable anxiety when I looked at the nest.

All the Bluebirds in Bermuda do not build nests in this manner, for I saw one which was discovered by Mr. A. H. Clark in the capstan of an old wreck (that was about July 10, and the nest contained three nearly fledged young).

Major Wedderburn in Jones's 'Naturalist in Bermuda' states that the Yellow-bellied Woodpecker (*Sphyrapicus varius*) bred in Bermuda occasionally and that many palmetto trees were bored by them, but I saw no woodpecker holes, and there were very few palmettos in the neighborhood of the nest at Hungary Bay. The lack, or scarcity of woodpecker holes is probably what induced the birds to build a nest placed on a branch of the only common tree.

I have looked up the nesting habits of the Bluebird in a number of

books and have seen no reference to its building a nest such as I have described.— OWEN BRYANT, *Cambridge, Mass.*

Dates of Nesting of Bermuda Birds.— As little has been published in regard to nesting habits of Bermuda birds the following observations may prove interesting. I was not there to find birds' eggs and only an insignificant part of my time was spent at it, so the data are few.

ENGLISH SPARROW (*Passer domesticus*). June 27, 1903. Flatts. Two nests with young; 1 nest with 5 eggs, incubated; 2 nests with 4 eggs, incubated.

CAT BIRD (*Galeoscoptes carolinensis*). June 28, 1903. Hungary Bay. One nest with 3 eggs, incubated.

July 8, 1903. Flatts. One nest with three fresh eggs. All the nests I found were in bushes 3–10 feet from ground. (Nests the same as in New England.)

YELLOW-BILLED TROPIC BIRD (*Phaëthon flavirostris*). June 30, 1903, Castle Island. One nest with fresh egg; several nests with downy young, about 6 in. long.

June 10. Harrington Sound. One nest with incubated egg; several nests with half grown young. All were in holes in rock. One was a mere depression in a flat rock; others 2 to 4 feet deep.

CARDINAL BIRD. (*Cardinalis cardinalis*). July 8. Flatts. One nest with three eggs, nearly hatched. In the top of a rather small cedar tree about 20 feet up. It was high enough to be quite conspicuous. The bird called my attention to it by squeaking.

EUROPEAN GOLDFINCH (*Carduelis carduelis*). June 29. Trunk Island. Saw one of the old birds fly on to the nest, which was empty but apparently finished.

July 6. The same nest contained 4 fresh eggs. It was in a cedar tree, about 25 feet up, on a horizontal branch 6 or 7 feet from the trunk. It was made mostly of yellow down and looked very much like the nest of our Yellow-bird.— OWEN BRYANT, *Cambridge, Mass.*

Unusual Records near Boston, Mass.— During the last winter and spring a number of uncommon birds have come under our notice, and although none of them are rare, they may be worthy of record.

Larus philadelphia. One was seen flying over the Charles River near the Harvard Bridge, May 14, 1904.

Sula bassana. A single bird was observed April 8, 1904, off Lynn Beach.

Mareca americana. One spent April 17, 1904, on the Chestnut Hill Reservoir, Brighton, in company with two Black Ducks.

Aythya marila. A flock estimated to number about six hundred wintered about Moon Island. We have not found them wintering at any other point in Boston Bay.

Chairtonetta albeola. A small flock remained at Moon Island, Boston Bay, during the winter.

Gallinago delicata. A pair spent the past severe winter along a small brook in the Arnold Arboretum, Jamaica Plain, Mass.

Ægialitis vocifera. Two were observed in the Middlesex Fells, Mass., on April 6, 1904.

Nyctea nyctea. One was seen March 5, 1904, at Squantum, Mass.

Acanthis linaria. A flock of ten Redpolls and one Goldfinch was observed in the Arnold Arboretum, Jamaica Plain, Mass., February 13, 1904. On March 2, 1904, a flock containing one Redpoll and thirteen Pine Finches was recorded in Brookline, Mass.

Mimus polyglottos. One passed the winter in Jamaica Plain, Mass. We last recorded it on April 6, 1904.

Hylocichla guttata pallasii. Observed on January 1, 1904, in Brookline, Mass., and January 8, 1904, at Chestnut Hill, Mass. (Auk, Vol. XXI, p. 283).— FRANCIS G. AND MAURICE C. BLAKE, *Brookline, Mass.*

Scott Oriole, Gray Vireo, and Phœbe in Northeastern New Mexico.— *Icterus parisorum* was found during the breeding season last summer on both sides of the thirty-fifth parallel, a little west of the one hundred and fourth meridian, which is an extension of its range from southern New Mexico. On May 26 one was seen in some box elders on the Pecos River a few miles from Santa Rosa, south of the thirty-fifth parallel, and on May 28 another was noted in a cañon in the same locality. Near Montoya, at the base of the northernmost point of the Staked Plains, north of the thirty-fifth parallel, in the middle of June a pair of the birds were going about among the junipers, and the song of the male was heard continually.

Vireo vicinior was also found in the junipers at Montoya, which is an extension of range from Western Texas. Only one specimen was taken but vireos, apparently of the same species, were abundant in the junipers, singing loudly throughout the day. A vireo nest with three newly hatched young was found on June 15. The nest was made principally of shreds of bark, apparently the soft juniper bark, and, unlike ordinary vireo nests, was unadorned.

Sayornis phœbe is hardly a bird that one would look for in the arid plains region of New Mexico, but in the cañons breaking down from the plains to the Pecos River exist conditions that are far from those of arid plains. Near Santa Rosa, from our juniper and cactus-covered camp ground, we climbed down into one of these box cañons that boasted numerous water pools, fresh green cottonwoods, willows, woodbine, grapevines, and one patch of cat-tails, in which a warbler that we took for a female Yellow-throat hid away at our approach. Here, in a niche of rock over a water pool we found a pair of phœbes feeding young in the nest on May 29, and the brooding bird was so tame that she let us photograph her at a distance of ten feet, so that her light chin shows to advantage. Her mate

meanwhile called *phœ'-be* from a tree near by, dishing his tail and sweeping out after insects.

Other phœbes were seen about the same time in the vicinity. One, which was apparently catching insects for its young, was seen around one of the deep pools on the outskirts of Santa Rosa. The conditions in these places are so favorable that it would indeed seem strange if wanderers through the region were not occasionally tempted to stop.— FLORENCE MERRIAM BAILEY, *Washington, D. C.*

RECENT LITERATURE.

Hoffmann's 'Guide to the Birds of New England and Eastern New York.'[1] — Happy the beginner into whose hands this little volume falls! for his first impressions of bird life, whatever else may betide, will never have to be unlearned. Here is a refreshing book that sets a new standard for similar guides while putting to shame many of greater pretensions. Mr. Hoffmann's long experience as a field observer and his ready grasp of the needs of the beginner have enabled him to season his pages with much that is not only crisply original but, at the same time, is of very practical application in identifying birds afield. We are told in a few words what open eyes may see out-of-doors. The preliminary chapters are concise, the keys, entirely for field identification, are arranged for every month in the year, and the bulk of the volume is devoted to snap-shot pen pictures of over two hundred and fifty familiar species of New England birds. The rarities are omitted, but so true to life are these snap shots that I am sure many of us can almost hear the songs and notes familiar to our ears and see the characteristic markings and motions so faithfully portrayed. One of the chief charms of the book is its uniformity. No species is slighted, and the care with which the author dwells upon diagnostic details of plumages, actions, and songs has perhaps never

[1] A Guide to the | Birds of New England | and | Eastern New York | Containing a Key for each Season and short | Descriptions of over two hundred and | fifty Species with particular Refer- | ence to their Appearance | in the Field | By | Ralph Hoffmann | Member of the American Ornithologists' Union | With four full-page plates by Louis | Agassiz Fuertes and nearly | one hundred cuts in | the text | [vignette] | Boston and New York | Houghton, Mifflin and Company | The Riverside Press, Cambridge | 1904. — 12mo, pp. i–xiii, + 1–357, pll. iv, cuts in text. $1.50.

been equalled. We cannot but feel regret that so much has been compressed into so little space, for this part of his work will appeal strongly to many besides the novice. The latter will revel, or very likely flounder in the keys which are certainly extremely ingenious; still the inherent disregard of birds for classification is not entirely overcome. It will strike some that the measurements have been given with a superfluous minuteness that will only tend to confuse the beginner. Why not tell him the Phœbe is 7 inches long rather than '6.99'? and the added or subtracted hundredths of an inch here and there would have made the keys look less like time-tables. Otherwise, the descriptive details, as far as they go, are admirable and it is a pleasure to turn pages which are so filled with morsels of useful information that we could wish for bigger bites. Four illustrations by Mr. Fuertes and numerous appropriate woodcuts add life to the pages, which are neatly and clearly printed. Even the cover is attractive and no one will begrudge the sooty Chimney Swift his gilded body, for ever since in 'Citizen Bird' Dr. Coues and Mrs. Wright perched him on the telegraph wires, we must expect some conventional liberties to be taken with this 'spruce cone with wings.' It is to be hoped Mr. Hoffmann's book will have the warm reception of which it is so deserving, and he himself is to be congratulated on having employed his pen to such good purpose.—J. D., Jr.

Hornaday's 'The American Natural History.'[1] — This very useful work is intended to bridge the "chasm that is wide and deep" between "the 'scientific' zoölogy, suitable only for students in the higher colleges and universities" and "the 'nature-study' books of the grammar schools." It is not a manual of the vertebrate zoölogy of North America, as it attempts to treat only "about three hundred important and well chosen species of animals," of which a number are exotic, selected to fill in important gaps in the general system of vertebrate life. It is systematic in arrangement, beginning with the highest class, or mammals, and ending with the lampreys and lancelets. There is a general introduction of about eight pages (pp. xix-xxv), explanatory of classification, nomenclature, and other technicalities, all very useful and pertinent, and including a timely warning notice against the present tendency "to idealize the higher animals, to ascribe to them intelligence and reasoning

[1] The American | Natural History | A Foundation of useful Knowledge of | the Higher Animals of North America | By | William T. Hornaday | Director of the New York Zoölogical Park; Author of | "Two Years in the Jungle," etc. | Illustrated by 227 original drawings by Beard, Rungius, | Sawyer, and others, 116 photographs, chiefly by Sanborn, | Keller, and Underwood, and numerous charts and maps | Charles Scribner's Sons | New York, MCMIV—8vo, pp. xv +449, numerous full-page half-tones and text cuts, including maps and charts. $3.50, postage extra.

powers which they do not possess, and in some instances to 'observe' wonderful manifestations that take place chiefly in the imagination of the beholder." To mammals are assigned 170 pages, to birds 140, to reptiles 43, to amphibians, 12, to fishes 75. The information given is well chosen and well apportioned, the more important or more interesting groups being selected for fuller treatment in comparison with those of less popular interest. The nomenclature, particularly of the mammals, is well up to date, for which the author acknowledges his indebtedness to the influence and kind assistance of Dr. T. S. Palmer. In general only a few prominent species are mentioned, as examples of their kin, but in this way a large amount of very useful information is attractively presented. The illustrations are abundant, and for the most part excellent for their purpose. The work has a characteristic personality, and an offhand and emphatic way of putting things that will prove attractive to many readers and less pleasing to others. There is a tendency to sweeping declarations that a little more care or thoughtfulness on the author's part would have rendered less open to criticism, as the statement regarding the pouch for the young in marsupials, the reader being left to infer that it is characteristic of all members of the order. Neither are his confessions respecting his lack of knowledge of the vocal powers of the Ruby-crowned Kinglet and Rose-breasted Grosbeak creditable to his powers of observation as an ornithologist; and what shall we say of the lapsus whereby he tells his readers that "The Order Machrochires means literally 'odd ones.'"

But notwithstanding an occasional indiscretion Mr. Hornaday's 'The American Natural History' is a valuable and helpful book that well fills a hitherto serious gap in our popular natural history literature, treating as it does, in a general and very helpful way, the vertebrates of North America in the compass of a single volume.— J. A. A.

The 'Baby Pathfinder to the Birds.'—"This little guide[1] has been prepared primarily," the authors state, "for New England, but should be of service in New York, New Jersey and Pennsylvania." It is restricted to land birds, and mostly to the Passeres, and gives in a few lines the "general appearance of adult birds as seen in the field," and a few words about the song, nest, and breeding range of each of the 110 species treated. Its small size renders it a convenient booklet for the pocket, and it should prove a convenient and helpful vade mecum for the student when afield, —J. A. A.

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[1] Baby Pathfinder to the Birds | Illustrated | A Pocket Guide to One Hundred and Ten Land Birds of New England | with blank pages for Notes | By Harriet E. Richards and Emma G. Cummings | Members of American Ornithologists' Union | — | W. A. Butterfield, Publisher, 59 Bromfield St., Boston, Mass. | 1904 — 125 leaves, printed on one side; type-bed 1¾ × 3¼ in.

Proceedings of the Delaware Valley Ornithological Club.— The present number of 'Cassinia'[1] forms volume VII of the Proceedings of the Delaware Valley Ornithological Club, and consists as usual of papers relating to the ornithology of Pennsylvania and New Jersey and an abstract of the proceedings of the Club, published under the editorship of Mr. Witmer Stone. The first article is an appreciative biographical sketch of John Kirk Towensend, by Mr. Stone, with a portrait. Other papers are: 'The Red-headed Woodpecker as a Pennsylvania and New Jersey Bird,' by Spencer Trotter; 'Notes on the Summer Birds of Lehigh Gap, Pennsylvania,' by James A. G. Rehn, an annotated list of 50 species; 'Exit the Dickcissel — a Remarkable Case of Local Extinction,' by Samuel N. Rhoads (noticed below, p. 401); 'Crow Roosts and Flight Lines in Southeastern Pennsylvania and New Jersey,' by Herbert L. Coggins (with map); 'Water Birds of the Middle Delaware Valley,' by Henry W. Fowler (notes on about 60 species); 'A Remarkable Night Migration at Mt. Pocono, Pa.,' by William L. Baily; 'Report on the Spring Migration of 1903,' compiled by Witmer Stone; also 'Abstract of the Proceedings' of the Club for 1903; 'City Ornithology,' 'Bird Club Notes,' and list of officers and members.— J. A. A.

Oddi's 'Manuale d'Ornitologia Italiana.'[2]— In a compact volume (5×3½ in.) of about 1100 pages Count Oddi has presented us with a most excellent manual of Italian ornithology, fully up to the modern standard of ornithological handbooks. It is profusely illustrated, some 400 text cuts being from original designs made expressly for the work. About 125 pages treat of the generalities of the subject, as the external structure, molt, migration, geographical distribution, nidification, classification, etc., and form Part I; Part II, consisting of about 900 pages, and forming the systematic part, gives descriptions and short biographies of the 473 species and subspecies constituting the Italian avifauna. The classification is not modern, beginning with the 'Accipitres' and ending with the 'Pygopodes,' but the work appears to have been prepared with care, and must place Italian bird students under a debt of gratitude to its talented author.— J. A. A.

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[1] Cassinia, A Bird Annual. Proceedings of the Delaware Valley Ornithological Club of Philadelphia, 1903. Roy. 8vo. pp. 88, frontispiece, and several half-tone plates and maps. 50 cents.

[2] Manuali Hoepli | — | Manuale | di | Ornithologia Italiana | — | Elenco descrittivo | degli | Uccelli stazionari o di passaggio | finora osservati in Italia | Del | Conte Dott. E. Arrigona Degli Oddi | Libero Docente di Zoologia nella Regia Università di Padova, | Membro del Comitato Ornitologico Internazionale, etc. | Con 36 tavole | e 401 incisioni nel testo da disegni originali | [vignette] Ulrico Hoepli | Editore-Librario della Real Casa | Milano | 1904 — 5×3½ in., pp. 1–160, i-viii, 1 + 908, 36 half-tone plates and 401 text cuts. Lire 15.

Boardman's 'The Naturalist of the Saint Croix.'[1]— 'The Auk' for April, 1901 (XVIII, p. 219), contained a brief notice of the late Mr. George A. Boardman, for many years an Associate Member of the American Ornithologists' Union, having been elected in 1883, at the founding of the Union. In the present volume we have a detailed memoir, including extracts from his correspondence, with letters from several prominent ornithologists to him. The memoir gives first an account of the Boardman ancestry, followed by a description of the valley of the St. Croix River, the business interests of which he did so much to develop, and which was the principal scene of his natural history work. Then follows, in separate chapters, an account of his business and domestic life, his work as a naturalist, the closing years at his home at Calais, a description of the Boardman collection, some of the scientific results of his life work, and further chapters on his personal characteristics, testimonials of appreciation from prominent naturalists, and extracts from his correspondence. The book concludes with lists of the vertebrates of the St. Croix valley, and short extracts from Mr. Boardman's natural history writings, in illustration of their character.

Mr. Boardman was "one of the pioneer field naturalists of the United States," an intimate friend of Baird, Brewer, Lawrence, and other ornithologists who haved "passed on," and of others who still remain, to whom collectively this memoir "is respectfully and lovingly dedicated." Between the Baird and Boardman families there was close intimacy for many years, which terminated only with the death of Professor Baird.

Mr. Boardman had very scanty school advantages, but became a very successful business man, and possessed personal traits that endeared him to a wide circle of friends. As a lumber merchant and lumber manufacturer he quite early in life acquired a competence, and was thus able to devote his later years to field work in natural history and to travel. He visited California, spent seventeen winters in Florida, and several seasons in Minnesota. The history of his life is here judiciously and simply told, and forms a narrative so replete with personal incident as to be little short of fascinating, especially to those who knew Mr. Boardman personally and his naturalist friends here mentioned; and also to all those of kindred tastes and sympathies. It is a record of personal history well worthy of the permanent form here given, containing, as it does, much of special interest relating to the natural history, and especially the ornithology, of Maine and Florida in times now long past. There are a

[1] The | Naturalist | of the Saint Croix | Memoir of | George A. Boardman | A selection from his correspondence | and published writings, notices of friends | and contemporaries with his | List of the Birds of Maine and New Brunswick | By | Samuel Lane Boardman, M. S. | University of Maine, Honorary, 1899 | Bangor | Privately printed | 1903—8vo, pp. xv+311, and 25 pll. (Edition, 500 copies, for private distribution.)

few errors in the rendering of personal names, as Dr. Heemann for Dr. Heermann, and Dr. Holden for Dr. Holder, due doubtless to obscure manuscripts; and the lists of mammals, fishes and reptiles are marred by serious typographical errors. But these are slight defects in a work otherwise exceedingly creditable. The twenty-five plates give facsimiles of letters from Baird, Sclater and Dresser; several portraits of the subject of the memoir, of his wife, of Baird, Dr. William Wood, Henry E. Dresser, and Charles Hallock; views of the Boardman residences at Milltown and Calais, interior views of his Bird Museum at Calais, etc. Boardman's list of 'St. Croix Birds,' originally published in 1862, and thus forming one of the earliest local bird lists of the United States, was republished and brought down to date in the Calais 'Weekly Times' in 1899 and 1900; this revised list is here republished (pp. 300–316), "without change" except to substitute the A. O. U. nomenclature for the obsolete nomenclature of forty years ago, previously employed on both occasions. It numbers 274 species, briefly annotated. The 'Natural History Sketches' would have increased interest had the date and place of publication been added, as has been done in the case of the 'Minor Notes on Natural History.'—J. A. A.

Pearson's 'Three Summers among the Birds of Russian Lapland.'—This is a narrative of three[1] ornithological expeditions to Russian Lapland, made respectively in 1899, 1901, and 1903. Various points along the coast were visited, considerable time being spent near the mouth of the Ukanskœ River, and a trip was made southward from Kola into the interior. The preface gives a brief notice of previous ornithological explorations of the region and of published accounts of them, including his own journey in 1895, recounted in 'Beyond Petsora Eastward.' The observations made during the three journeys take the form of a daily record of the author's experiences and thus have a setting and a freshness that would be lost in a more formal method of presentation; there being, however, only the briefest summary by species (Appendix I), recourse must be had to the index to find all that has been recorded of any particular bird. But the narrative is not lacking in interest, aside from its ornithological bearings, while the conditions of bird life in this dreary region are thus brought graphically before the reader. Thus, under date of June 2, 1899, at Devkin Bay, we read: "Near the house were fifteen to twenty Shore-Larks (*Otocorys alpestris*), feeding on a small piece of uncovered ground; while two White Wagtails flitted about from doorstep

[1] Three Summers among | the Birds of | Russian Lapland | By | Henry J. Pearson | author of "Beyond Petsora Eastward" | With History of | Saint Triphon's Monastery | and Appendices | London | R. H. Porter | 7 Princes Street, Cavendish Square, W. | 1904—8vo, pp. i-xvi+1–216, 68 half-tone plates, and map.

to water-trough as tame as London sparrows. The first Merganser (*Mergus serrator*) we had seen this year rose near the shore as we rowed in from the ship. Except these and a stray Herring-Gull the place was a desert to-day as far as bird-life was concerned. We could hardly expect it to be otherwise when the whole country, except the Shore-Larks' patch, was buried under two or three feet of snow! And this on the 2nd of June."

The first three chapters (pp. 1–169) contain the narrative of the three expeditions; the fourth (pp. 170–192) gives a history of Saint Triphon's Monastery, founded about 1532; Appendix I (pp. 192–201) is a tabular list of 182 species of birds observed by the author and others, the table giving twelve different stations. A second appendix (pp. 202–209) relates to food and equipment, giving not only lists of foods, clothing, implements, etc., required, but much practical advice as to outfit and camp arrangements. Of the 68 excellent half-tone plates, about one third are ornithological, the rest being views of the country and its Lapp inhabitants and their mode of life.— J. A. A.

Jacobs's 'The Haunts of the Golden-winged Warbler.'— In this small brochure[1] Mr. Jacobs gives the results of his studies of the Golden-winged Warbler (*Helminthophila chrysoptera*), which he has found to be a common breeding bird at Wainsburg, Pa., where he has made it the subject of special observation for the last dozen years or more. He describes in detail and illustrates its favorite haunts, and its nest and eggs. Its nesting habits and eggs are very fully described; in nineteen nests the number of eggs ranged from three to six, the prevailing number being four. The period of incubation appears to be about ten days, and in ten days more the young are able to leave the nest.— J. A. A.

Scott on the Rearing of Wild Finches by Foster-parents of other Species.[2] — Experiments were made by placing the eggs of Song Sparrows (*Melospiza melodia*), Field Sparrows (*Spizella pusilla*), Yellow-winged Sparrows (*Coturniculus savannarum passerinus*), Cowbirds (*Molothrus ater*), and Bobolinks (*Dolichonyx oryzivorus*) under canaries, by which they were hatched and the young carefully nursed. In the case of the young Song Sparrows, though solicitously attended by the hen canary,

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[1] Gleanings No. III. The Haunts of the Golden-winged Warbler. (*Helminthophila chrysoptera.*) With Notes on Migration, Nest-building, Song, Food, Young, Eggs, etc. Illustrated. By J. Warren Jacobs, Waynesburg, Pa., Independent Printing Company. 1904. 8vo. pp. 30, 5 half-tone plates and a color chart.

[2] An Account of Some Experiments in Rearing Wild Finches by Foster-parent Birds. By W. E. D. Scott, Science, N. S., Vol. XIX, No. 483, pp. 551–554, April 1, 1904.

they soon began to weaken and died when about six days old, when they "were just beginning to show feathers." Young Field Sparrows and two Cowbirds hatched and tended in the same way, lived for only a few days; similar experiments with Bobolinks and Yellow-winged Sparrows had a similar ending. In each case the foster-parents were faithful to their charges. "To briefly summarize the work I have described in some detail," says Mr. Scott, "forty-one different eggs of wild birds, representing six species, and three young birds already hatched, form the aggregate of individuals dealt with. All of the forty-one eggs were fertile, and were hatched by the foster-parents. This is suggestive in regard to the propagating powers of wild birds, and though not conclusive, indicates a much higher percentage of fertility in the eggs laid by them than obtains in song birds when caged, or semi-domesticated. None of the young which were hatched from these eggs reached a greater age than seven days which would seem to indicate that the food supplied by the foster-parents, which was the same on which they raised their own offspring, was of a kind so different from that used by wild birds in rearing their young, that it proved inadequate, I also believe that the nest lining was of a character so unlike that of the nests natural to the foster-chicks, that it prejudiced their development and growth."

Evidently canary-bird food is not a good substitute for the large proportion of insect food our wild passerine birds are known to furnish for the sustenance of their nestlings.—J. A. A.

Scott on 'The Inheritance of Song in Passerine Birds.'—In a recent paper in 'Science,' Mr. W. E. D. Scott presents some interesting observations on the inheritance of song in hand-reared Bobolinks and Red-winged Blackbirds.[1] The birds were kept where it was believed they could not hear the song of their own species, but were allowed to hear the songs of many other birds. In the case of the Bobolinks, there was no resemblance, either in the call-notes or the song, to any sounds uttered by wild bobolinks; the call-notes of the Redwings resemble those of the wild birds, but the song "seems to be made up of a composite jumble wherein robin and thrush-like notes of great clearness and volume predominate." This is rather surprising when we consider how persistent are the call-notes and the general character of songs in wild birds, both in time and space, as exemplified throughout large genera, and even among species of allied genera, as in certain genera of Thrushes, Flycatchers, Bobwhites, etc.—J. A. A.

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[1] The Inheritance of Song in Passerine Birds. Remarks and Observations on the Song of hand-reared Bobolinks and Red-winged Blackbirds (*Dolichonyx oryzivorous* and *Agelaius phœniceus*). By W. E. D. Scott. Science, N. S., Vol. XIX, No. 473, p. 154, Jan. 22, 1904.

Rhoads on the Extinction of the Dickcissel East of the Alleghanies.[1]— The Black-throated Bunting, or Dickcissel (*Euspiza americana*), formerly ranged along the Atlantic coast, at least in small numbers, from South Carolina to Maine, and at many points within the area was locally common. Mr. Rhoads here gives good reason for now proclaiming it "a bird of the past," throughout this extensive area. Altogether there is little or nothing to suggest a satisfactory explanation of this decadence. Mr. Rhoads inclines to the belief that the birds have been induced to change their range and join the Mississippi Valley stock, and that they were not exterminated in their former haunts. Whatever the cause, they have certainly gradually and almost wholly disappeared in the East within the last fifty years,— from Massachusetts, Connecticut and eastern New York prior to or soon after 1880, and there appears to be no record of their occurrence in New Jersey or eastern Pennsylvania since 1890. Mr. Rhoads has thus done well to gather up and place collectively on record the history of its decline and disappearance from the Atlantic seaboard, especially as much of the evidence he has here presented was previously unpublished.— J. A. A.

Silloway's Additional Notes on the Summer Birds of Flathead Lake.[2] — As stated in the introduction, the present notes relate to the birds observed at Swan Lake during the first three weeks of June, 1902, and serve as a supplement to his former paper entitled 'The Summer Birds of Flathead Lake' (see Auk, XIX, 1902, p. 216). The paper is divided into three parts, entitled, respectively, 'Oölogical Notes' (pp. 295–300), 'Notes on New Birds' (pp. 301–333), and 'List of Birds' (pp. 304–308). Under the first heading interesting notes are given on the breeding habits of about twenty species; under the second about a dozen species are added to the previous list; the third division is a briefly annotated list of the summer birds of the Flathead Lake region, numbering one hundred and thirty-seven species, and including all the species thus far noted. The five half-tone plates illustrate the physical features surrounding Swan Lake. — J. A. A.

Swarth on the Birds of the Huachuca Mountains, Arizona.[3]— The

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[1] Exit the Dickcissel — a remarkable Case of Local Extinction. By Samuel N. Rhoads. 8vo. pp 12. Reprinted from Cassinia, 1903, pp. 17-28, *repaged*, and without indication of its original place of publication.

[2] Additional Notes to Summer Birds of Flathead Lake, with special reference to Swan Lake. By Perley Milton Silloway. With introduction by Morton J. Elrod. Bulletin University of Montana, Biol. Series No. 6, 8vo, pp. 289–308, pll. liii-lvii, 1903.

[3] Birds of the Huachuca Mountains, Arizona. By Harry S. Swarth. Pacific Coast Avifauna No. 4. Cooper Ornithological Club of California. Los Angeles, California. Published by the Club, April 15, 1904.— Large 8vo, pp. 70.

Huachuca Mountains form a well-wooded range, extending for about forty miles in a northeast-southwest direction, in the southeastern corner of Arizona, their southern extremity extending across the boundary into Mexico. The base level is about 4500 feet, and the higher central peaks rise to an altitude of about 10,000 feet. These mountains have often been visited by collectors, but hitherto little has been published on the birds of the region. The results here recorded are based on three trips made by Mr. Swarth, respectively, in 1896 (April 25 to July 20), in 1902 (March 29 to September 5), and in 1903 (February 17 to May 30). On the first expedition he was accompanied by Messrs. W. B. Judson, H. G. Rising, and O. W. Howard, and the season was spent in Ramsey Cañon; in 1902 he was again accompanied by Mr. Howard, but in 1903 he was unaccompanied. "Almost all the collecting was done on the east side of the mountains, in the seven canyons from Tanner to Ash Canyon, by far the best part of the range, ornithologically considered." The basis of the present paper is a collection of about 2500 skins, collected personally by Mr. Swarth, and the field notes made therewith. An introduction of three pages, descriptive of the physical features of the region, is followed by a systematic list of the species, one hundred and ninety-five in number. The annotations range from a few lines to a couple of pages for each species, according to their interest, amounting in some cases to quite full biographies.

Mr. Swarth believes that *Melanerpes formicivorus aculeatus* Mearns is entitled to recognition as a subspecies, and that *Phalænoptilus nuttalli nitidus* is probably only a color phase of *nuttalli*.— J. A. A.

Bartsch on the Herons of the District of Columbia.[1] — Nine species of Herons have been recorded from within the District of Columbia, eight of which are of regular occurrence. The Black-crowned Night Heron is the most abundant, of which there are three breeding colonies within the District and another just outside its borders. A detailed and very interesting account of these colonies occupies the greater part of the paper. Two of them were carefully investigated in 1902, and an estimate made of their population, from which it appears that probably eighty-eight young were raised that season in the smaller colony and very nearly four hundred in the other. The Little Blue Heron is also numerous, in company with which may often be seen the Snowy Heron and the American Egret. Next to the Night Heron, the Little Green Heron is the most abundant breeder. Four of the seven half-tone plates illustrate the nesting haunts, eggs, and young of the Night Heron, one shows different stages of the young of the Green Heron, and one (with six figures) the

[1] Notes on the Herons of the District of Columbia. By Paul Bartsch. Smithsonian Misc. Collections, Vol. XLV, pp. 104–111, pll. xxxiii–xxxviii. (Dated "Dec. 9, 1903," but published two months or more later.)

roosting and feeding places of the Little Blue Heron and American Egret, etc.— J. A. A.

Nelson on New Birds from Mexico.— Ten of the thirteen species and subspecies here described[1] were obtained by Mr. Nelson and his assistant Mr. Goldman during their expedition to southwestern Mexico in the winter of 1902–03, mostly in the States of Guerrero and Michoacan. In most cases the new forms are based on good series of specimens, and several of them seem quite strongly differentiated from their nearest known allies.— J. A. A.

Nelson's 'Revision of the North American Mainland Species of Myiarchus.'[2] — The present paper covers the species of the genus *Myiarchus* occurring north of the Isthmus of Panama, including those of Cozumel Island and the Tres Marias Islands. Nine species are recognized, with ten additional subspecies, of which three of the latter, belonging to the *lawrencei* group, are described as new. In his introductory remarks Mr. Nelson calls attention to the evanescent character of the brighter or more intense colors of the freshly acquired plumage. "This extreme intensity of coloration [of the fresh plumage] quickly passes into a duller condition which continues with but little change through the winter months. In spring the colors gradually fade or become bleached by the sun until in the breeding season the original shades of greenish, olive and gray of the back and the yellow of the under parts are almost lost in the dingy browns and yellows of the frayed plumage." He also calls attention to the wide range of variation in the extent of the dusky pattern of the tail feathers, the non-recognition of which has led to the recording of *M. nuttingi* as a bird of southern Arizona, the supposed Arizona specimens of *nuttingi* proving to be merely females of *M. cinerascens*. Mr. Nelson, however, adds to the United States list *Myiarchus crinitus residuus* Howe, based on Florida specimens, on the ground of a slight average difference in the length of the bill. This separation had previously been made, on exactly the same basis, by Mr. Bangs and rejected by the A. O. U. Committee as too unimportant for recognition in nomenclature.

Mr. Nelson discusses at some length the old case of *Tyrannula mexicana* Kaup vs. *Myiarchus cooperi* Baird, without reaching a positive conclusion, but gives his reasons for believing that *Tyrannula mexicana* = *Tyrannula cinerascens* Lawrence, and that the present *Myiarchus mexi-*

[1] Descriptions of New Birds from Southern Mexico. By E. W. Nelson. Proc. Biol. Soc. Washington, Vol. XVI, pp. 151–160, Nov. 30, 1903.

[2] Revision of the North American Mainland Species of *Myiarchus*. By E. W. Nelson. Proc. Biol. Soc. Washington, Vol. XVII, pp. 21–30, March 10, 1904.

canus of the A. O. U. Check-List should stand as *Myiarchus cooperi* Baird.— J. A. A.

Bangs on Birds from Honduras.— This is a report on a collection of birds and mammals made by W. W. Brown, Jr., on the coast of Honduras, at Ceiba and Yaruca, in January and February, 1902. The list of birds numbers 126 species and subspecies, of which four are described as new. The annotations consist of a statement of the number of specimens of each and the localities. About one fifth of the species recorded are North American migrants.— J. A. A.

McGregor on Philippine Birds.[2]— This is the second paper (see Auk, XX, 319) in the series of reports on the zoölogical collections made for the Philippine Museum, and contains a list of all the identified species collected or observed on a number of expeditions to Benguet Province, Luzon, and to the islands of Lubang, Mindoro, Verde, Cuyo, Aguataya, and Cagayaucillo. The islands and their faunal relationships are briefly described, followed by notes on the rarer species and descriptions of previously unknown plumages, forming an annotated list of about 40 species, and about 270 species are recorded from new localities. *Pericrocotus novus* Wardlaw Ramsey, previously almost unknown, is described at length, including old and young of both sexes.— J. A. A.

Code of Botanical Nomenclature.— The May number of the 'Bulletin of the Torrey Botanical Club' (Vol. XXXI, No. 5, May, 1904, pp. 249–290) contains a new 'Code of Botanical Nomenclature,' prepared by the 'Members and Alternates of the Nomenclature Commission,' appointed by the Botanical Club of the American Association for the Advancement of Science at a meeting held in Washington, D. C., January 2, 1903. This commission consists of twenty-three members, all prominent American botanists. It appears to have accomplished the task assigned it in a most satisfactory manner, the Code now presented being concise, comprehen sive, and explicit. The Commission "has carefully considered all the principles involved, and has tested the application of the principles to all kinds of cases." It is published in English, French, and German, the English version occupying only 13 pages (pp. 249–261). It has been prepared as a substitute for the Paris Code of 1867, which was found not satisfactorily adaptable to present conditions. It thus bears much the same relation to this code that the A. O. U. Code does to the Stricklandian

[1] Birds and Mammals from Honduras. By Outram Bangs. Bull. Mus. Comp. Zoöl., Vol. XXXIX, No. 6, pp. 141–159, July, 1903.

[2] Birds from Benguet Province, Luzon, and from the Islands of Lubang, Mindoro, Cuyo, and Cagayaucillo. By Richard C. McGregor. Bulletin of the Philippine Museum, No. 3, Jan. 30, 1904, pp. 16.

Code of the British Association, published in 1865. An effort will be made to secure the adoption of this new Botanical Code by the International Botanical Congress to be held in Vienna in 1905.

The Code consists of three parts, 'Principles,' 'Canons,' 'Orthography and Citation.' Part II, Canons, is divided into five 'sections,' as follows: I, Categories of Classification; II, Formation of Names; III, Publication of Names; IV, Application of Names; V, Rejection of Names. This Code does not depart essentially in any way from the A. O. U. Code, but it is on some points fuller and more explicit, and at the same time more concise. But the A. O. U. Code was a pioneer in innovations which have now become very generally accepted, but which then required argument and extended illustration.

Under 'Rejection of Names' (under Canon 16) it is stated: "Similar names are to be treated as homonyms only when they are mere variations in the spelling of the same word"; thus implying the converse, that of mere variants of a name, only the form having priority is tenable.

In Part III, under 'Orthography,' is the following: "The original orthography of names is to be maintained, except in the following cases; the change not to affect priority. (*a*) Manifest typographical errors may be corrected. *Examples.*— *Scoria* Raf. is a misprint for *Hicoria*; *Rumhora* Raddi is a misprint for *Rumohra*, named for K. von Rumohr." Other provisions require specific and subspecific names to agree in gender with their generic names; generic names derived from persons should take the feminine form, and should be changed, if formed otherwise; as, *Lippius*, *Kantius*, etc., to be changed to *Lippia*, *Kantia*, etc. Also names proposed in works in which *v* and *j* were used as vowels, or *u* and *i* as consonants, should be corrected to agree with modern usage, as "*Euonymus*, not *Evonymus*," "*Jungia*, not *Iungia*," etc.

Provision is made for a few points not covered by the A. O. U. Code; but the principles and spirit of this Code are so closely followed that it is exceedingly gratifying to see the work of the A. O. U. Committee, published twenty years ago, so fully endorsed by an able commission of American botanists.— J. A. A.

CORRESPONDENCE.

A Method of Obtaining a Temporary Stability of Names.

To the Editors of 'The Auk':

Dear Sirs: — It is within the power of the A. O. U. Committee on Nomenclature to mitigate, temporarily at least, the inconvenience of frequent changing of names and by a simple method to which the most hardened nomenclatural sinner can hardly object. It is by issuing a Check-List once every ten years without the intervening supplements which now so soon make it a thing of shreds and patches even for those who find time to post up their copies. The Check-List mirrors the Committee's approval of certain names and there are many earnest workers who have use for them, but workmen obliged to change their tools too often are not likely to do the best work, especially when the new tools are no better than the old. The latest name is a matter of concern to a very few, an available name is of great use to many. The proposed periods of quiet with distinct times of changes are not incompatible with advance, for facts do not alter with the years and too much change only creates confusion and clogs advance. If, then, a species has for fifty years rested in one genus nobody except the disturber of its rest need be in a hurry to put it in another, nor does a name buried a hundred years in an old volume suffer impairment if allowed to slumber a few years longer, more or less. So to, in the matter of new races, prompt ruling seems undesirable, for it makes them neither better nor worse, and time alone, with further investigation, is required to bring out their real value.

This is no reflection on the good work the Committee has done, but I believe all its judicial thunder might better be saved up for big periodical explosions rather than for small frequent ones. A Check-List in 1910 and at the end of each succeeding decade would disturb no vital principle and such a course might add further dignity and force to the decisions. It seems to me that this is often enough to furnish a new set of tools and I think that there would be less complaint of the instability of nomenclature if the Committee would not rule out or adopt a Check-List name except at stated intervals.

I remain,

Yours very truly,

Jonathan Dwight, Jr.

NOTES AND NEWS.

EDWIN SHEPPARD, for a number of years an Associate of the American Ornithologists' Union, died at Philadelphia, April 7, 1904, at an advanced age. Mr. Sheppard was an artist and worked for many years at the Academy of Natural Sciences making illustrations for various scientific works. Birds were his special delight and many familiar cuts are the results of his labors, as for instance the text figures in Baird, Brewer and Ridgway's 'History of North American Birds,' Mr. D. G. Elliot's volumes on 'Shore Birds,' "Ducks, Geese," etc. Dr. Coues once said of him that he had drawn "more and better figures of American birds than any living artist," which was doubtless true at the time, but his drawing, while accurate in detail, will not compare with the work of the modern school, who study the live bird rather than the stuffed specimen.

Mr. Sheppard was a native of Richmond, Va., and came north in early life to study art. At the outbreak of the Rebellion he enlisted in the Confederate army and at the close of the war returned to Philadelphia where he resided for the rest of his life.

He was a true type of the southern gentleman and a warm friend of both the bird and the ornithologist.— W. S.

FROM the Report of the Chief of the Division of the Biological Survey, Dr. C. Hart Merriam, for the year 1903 (Ann. Rep. Dept. of Agriculture, 1903, pp. 483–495) we learn that field work in connection with the study of the geographic distribution of mammals, birds, and plants was carried on in 1903 along the western slopes and foothills of the Sierra Nevada and in the Coast Ranges in California, under the immediate supervision of Dr. Merriam; in various parts of Texas and New Mexico, under Mr. Vernon Baily; in southern Mexico, by Messrs. Nelson and Goldman; in Alaska, under Mr. W. H. Osgood, and in the Barren Grounds near the Arctic coast by Mr. E. A. Preble. In most of these regions field work will be continued during 1904. Investigations in Economic Ornithology were continued as usual by Prof. Beal and Dr. Judd; and the work of game protection, under Dr. Palmer, has been successfully carried on, with most important results. The completion of "a bibliography of works relating to the occurrence of North American birds south of the United States" has been completed, and "all of the migration material collected in the past nineteen years has been overhauled, rearranged, and catalogued to date, so that it is now readily accessible." It is also announced that bulletins will be published during 1904 on 'Migration of North American Warblers,' and on 'Migration and Protection of Shore Birds.' A report on a biological survey of Texas is well advanced toward publication.

THROUGH the generosity of Mr. John E. Thayer, of Lancaster, Mass.,

Mr. W. W. Brown, Jr., has been sent on an expedition to Central America, mainly in the interest of the Museum of Comparative Zoölogy at Harvard College, the expedition to be known as 'The John E. Thayer Expedition of 1904–1905.' Mr. Brown, already so well known for his excellent work in tropical America for the Messrs. O. and E. A. Bangs, will make collections in all departments of natural history, as circumstances may favor, but will give special attention to vertebrates, and primarily to birds and mammals. With the exception of a portion of the birds, the material will all be presented to the Museum of Comparative Zoölogy, and will form the basis of a series of papers to be published in its 'Bulletin.' Mr. Brown started for his new field of labor in February, going first to the Pearl Islands in the Bay of Panama, which are great breeding resorts for various sea birds. He has thus far been very successful, having already sent to Cambridge ten large cases as the result of his work at the Pearl Islands.

Such munificence in the interest of science is worthy of the highest recognition, and it is to be hoped that Mr. Thayer's excellent example will be frequently emulated by other men amply provided with means for the promotion of scientific investigation, but who too often fail to appreciate the opportunities thus offered for not only advancing science but for raising an enviable and long-enduring monument to themselves.

Friends of the American Museum of Natural History having generously provided means for the construction of additional groups of characteristic North American birds, a number of such groups are now under construction at the Museum or have recently been installed, the latter including three California groups, representing the Yellow-billed Magpie, the newly described Sierra Dusky Grouse, and the California Partridge. A large California group is under way, which will later call for detailed mention. In order to secure groups representing species now rapidly approaching extinction, Mr. Chapman was sent to Florida early in March last to secure, if possible, materials for Carolina Paroquet and Ivory-billed Woodpecker groups. Although a few birds were found no nests were discovered, and the attempt to secure satisfactory materials for these groups proved a failure. From Florida Mr. Chapman went to the Bahamas in search of Flamingoes, and after some discouraging experiences succeeded in locating the rookeries; and the latest reports from him indicate that he has been successful in securing the necessary material for a fine group of these beautiful birds.

In this connection it may be stated that during the past year the ornithological collection at the American Museum has been increased by the addition, by purchase and through Museum expeditions, of about 13,000 birds, including the well-known Sennett Collection, which for many years has, through deposit, formed a part of the Museum's resources. Recently Dr. Dwight has transferred his collection, numbering about 8000 specimens, to the Museum for storage and use, thus still further increasing the ornithological resources of the Museum.

THE writing of so-called 'nature books' by a certain class of romancers has of late attracted the serious attention of naturalists who deplore the rapid development of this class of light literature, for the reason that many otherwise intelligent people who happen to know little of natural history are misled into taking such books as those recently put forth by William J. Long and Mason A. Walton at their face value and as veritable records of bona fide observations by competent naturalists, even school superintendents and school teachers of good standing innocently giving them their endorsement as proper 'nature books' for school use.

Several writers in 'Science' have recently taken up the matter, with especial reference to the writings of William J. Long. In 'Science' for Feb. 26, 1904, Prof. William Morton Wheeler, under the title 'Woodcock Surgery,' gave a critical and rather sarcastic analysis of Mr. Long's now famous article 'Animal Surgery' published in 'The Outlook' for September 12, 1903 (see Auk, Jan, 1904, pp. 88–90); and in 'Science' for March 4, 1904, Mr. Frank M. Chapman published a paper entitled 'The Case of William J. Long,' in which he quoted at length from a defense of Mr. Long published some time previously in the 'Evening Transcript' of Boston, and also some of Mr. Long's own 'confessions' as to his methods and aims as given in some of his books,— his "efforts to reveal 'a vast realm of nature outside of the realm of science' in 'ideas above and beyond the world of facts!'"

In 'Science' for April 22, 1904, Mr. William Harper Davis, a comparative psychologist of Columbia University, reviewed the discussion from the psycologist's standpoint, dwelling with some particularity upon "Mr. Long's gullibility," to whom he refers, after citing passages from his books, as "a confessed intellectual anarchist." The discussion is continued at still greater length by Mr. Long's rejoinder to his critics in 'Science' for May 13, 1904, in which, through the intervention of the editor, Mr. Long has the last word. Under the title 'Science, Nature and Criticism' Mr. Long makes the best of sundry indiscretions of his critics, and with an injured innocence air proceeds to produce various affidavits in proof of statements in his 'Animal Surgery' article, which show that there is "certainly warrant for believing that the woodcock sets his own broken leg," and also "that the habit is more common and widespread than [he] supposed possible when [he] published [his] own observations." Through good tact and skill he has made the best of his opportunities for defense and may be able to convince incompetent judges that he is an innocent victim of persecution, and that his statements have been met with "dogmatic denials mixed with considerable error and misrepresentation" rather than by candid objections and some knowledge on the part of his critics.

AN important work entitled 'The Geese of the Old World' is announced for early issue by subscription by Mr. Rowland Ward (166 Piccadilly, London). The work will be prepared by Sergius Alphéraky, Correspond-

ing Member of the Imperial Academy of Science of St. Petersburg, and illustrated with 24 colored plates by F. W. Frohawk, and a frontispiece by Dr. Suschkin depicting a Goose scene in Siberia. The subject will be treated both from a scientific and the sportsman's standpoint, and will treat fully of the habits, nesting, and geographical distribution of the species and subspecies. Subscription price, £2 12 6 net.

AT THE Annual Meeting of the Michigan Ornithological Club, held at Ann Arbor April 2, the following officers were elected for the ensuing year: President, Prof. Walter B. Barrows, Agricultural College; First Vice-President, Prof. A. H. Griffith, Detroit Museum of Art; Vice-Presidents, Norman A. Wood, Ann Arbor, and Jas. B. Purdy, Plymouth; Secretary, Bradshaw H. Swales, Detroit; Treasurer, Chas. E. Wisner, Detroit; Editor-in-chief, Alex. W. Blain, Detroit; Associates, Prof. Walter B. Barrows and J. Claire Wood.

WITH a view to obtaining positive evidence of the return of birds to the place of their birth, or otherwise, as the case may be, Mr. P. A. Taverner, of 95 North Grand Boulevard, W., Detroit, Michigan, proposes to attach small aluminum bands to the tarsus of young birds, in the hope that some of the birds thus tagged may afterward fall into the hands of ornithologists and be reported. The tag, for the sake of brevity of address, will be inscribed "Notify The Auk. N. Y.," to which any such discoveries should be reported for publication.

A NATIONAL association of wild animal photographers is being formed for the purpose of promoting the new form popularly known as "camera hunting." It is hoped that this organization will be an effective means of discouraging the unnecessary slaughter of American birds and other wild animals. All interested should write to Mr. Leroy Melville Tufts, Field Station, Biological Survey, U. S. Dept. of Agriculture, Farmington, Maine.

THIRTEENTH SUPPLEMENT TO THE AMERICAN ORNITHOLOGISTS' UNION CHECK-LIST OF NORTH AMERICAN BIRDS.[1]

At a session of the A. O. U. Committee on Nomenclature held in Washington in April, 1904, the following rulings were adopted. Departures from the nomenclature of the Check-List due to the adoption by authors of the 12th instead of the 10th edition of Linnæus's 'Systema Naturæ,' and those which are merely expressive of personal preference or opinion, without the presentation of new evidence, were not considered as requiring the formal reaffirmation of the Committee's previous rulings in such cases.

Owing to the limited time at the Committee's disposal, and the absence of the requisite material, many cases were deferred for later action. In view of the present large number of these it was decided to refer as many of them as possible to subcommittees for investigation, with instructions to report thereon to the full Committee at its next session, which it is hoped can be so planned that both time and material will be available to enable the Committee to dispose of practically all of the cases then awaiting action.

In preparing the present Supplement it has been deemed advisable to omit the secondary references to species and subspecies, together with the concordance and geographical ranges, and also the list of deferred cases.

Committee. J. A. Allen, *Chairman.*
Charles W. Richmond, *Secretary.*
William Brewster.
Jonathan Dwight, Jr.
C. Hart Merriam.
Robert Ridgway.
Witmer Stone.

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[1] Five Supplements have been issued since the publication of the Second Edition of the Check-List in 1895, as follows:

Eighth Supplement, Auk, XIV, Jan., 1897, pp. 117–135.
Ninth Supplement, Auk, XVI, Jan., 1899, pp. 97–133.
Tenth Supplement, Auk, XVIII, July, 1901, pp. 295–320.
Eleventh Supplement, Auk, XIX, July, 1902, pp. 315–342.
Twelfth Supplement, Auk, XX, July, 1903, pp. 331–368.

I. ADDITIONS TO THE CHECK-LIST AND ACCEPTED CHANGES IN NOMENCLATURE.[1]

GENUS **ENICONETTA** GRAY. This becomes

GENUS **POLYSTICTA** EYTON.

Polysticta EYTON, Catal. Brit. Birds, 1836, 58. Type, *Anas stelleri* PALLAS.

Eniconetta was proposed by Gray, to replace *Polysticta* EYTON, on the ground that the latter name was preoccupied by *Polysticte* SMITH (1836). Eyton's *Polysticta* has, however, two or three months' priority over *Polysticte* SMITH (*cf.* RICHMOND, Proc. Biol. Soc. Wash., XVI, 1903, 128). Steller's Duck thus becomes

157. **Polysticta stelleri** (PALLAS).

243*a*. **Pelidna alpina pacifica** (COUES). An earlier name is found in

243*a*. **Pelidna alpina sakhalina** (VIEILLOT).

Scolopax sakhalina VIEILLOT, Nouv. Dict. d'Hist. Nat., III, 1816, 359 (*cf.* BUTURLIN, Auk, 1904, 53).

297*c*. **Dendragapus obscurus sierræ** CHAPMAN.

Sierra Grouse.

Dendragapus obscurus sierræ CHAPMAN, Bull. Am. Mus. N. H., XX, April 25, 1904, 159.

GEOG. DIST. — California (forested portions of Transition and Boreal zones), north to Fort Klamath, Oregon.

GENUS **NYCTALA** BREHM. This becomes

GENUS **CRYPTOGLAUX** RICHMOND.

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[1] Including also eliminations from the Check-List.

Cryptoglaux RICHMOND, Auk, XVIII, April, 1901, 193. Type, *Strix tengmalmi* GMELIN.

Nos. 371, 372, and 372*a* will thus stand as

371. **Cryptoglaux tengmalmi richardsoni** (BONAPARTE).

372. **Cryptoglaux acadica** (GMELIN).

372*a*. **Cryptoglaux acadica scotæa** (OSGOOD).

454*a*. **Myiarchus cinerascens nuttingi** (RIDGWAY). The specimens recorded from Arizona, on the basis of which this species was introduced into the Check-List, are found to be female examples of *M. cinerascens* (*cf.* NELSON, Proc. Biol. Soc. Wash., XVII, 1904, 35). No. 454*a* is therefore to be eliminated from the list.

458*a*. **Sayornis nigricans semiatra** (VIGORS). This proves to be indistinguishable from *S. nigricans* (SWAINSON) (*cf.* BREWSTER, Bull. Mus. Comp. Zoöl., XLI, 1902, 119), and is to be removed from the list.

469.1. **Empidonax griseus** BREWSTER. This is found to be equivalent to *E. canescens* SALVIN & GODMAN, which has priority (*cf.* NELSON, Auk, 1904, 80). Hence:

469.1. **Empidonax canescens** SALVIN & GODMAN.

Empidonax canescens SALVIN & GODMAN, Biol. Centr.-Amer., Aves, II, Feb., 1889, 79.

488. **Corvus americanus** AUDUBON. An earlier name for the American Crow is found in

488. **Corvus brachyrhynchos** C. L. BREHM.

Corvus brachyrhynchos C. L. BREHM, Beitr. zur Vögelkunde, II, 1822, 56 (*cf.* RICHMOND, Proc. Biol. Soc. Wash., XVI, 1903, 125).

The Florida Crow thus becomes:

488*a*. **Corvus brachyrhynchos pascuus** (COUES).

498*g*. **Agelaius phœniceus richmondi** NELSON.

Vera Cruz Red-wing.

Agelaius phœniceus richmondi NELSON, Auk, XIV, Jan., 1897, 58.

GEOG. DIST. — Coast region and lower Rio Grande Valley of Texas, south through eastern Mexico to Yucatan, eastern Nicaragua and eastern Costa Rica.

503. **Icterus audubonii** GIRAUD. This becomes a subspecies of *Icterus melanocephalus* (WAGLER), and will stand as

503. **Icterus melanocephalus audubonii** (GIRAUD). (*Cf.* RIDGWAY, Bull. U. S. Nat. Mus., No. 50, pt. II, 1902, 282.)

GENUS **SCOLECOPHAGUS** SWAINSON. This name is preoccupied, and must give place to

GENUS **EUPHAGUS** CASSIN.

Euphagus CASSIN, Proc. Acad. Nat. Sci. Phila. (for 1866), 1867, 413. Type, *Psarocolius cyanocephalus* WAGLER. (*Cf.* RICHMOND, Proc. Biol. Soc. Wash., XVI, 1903, 128.)

The following alterations become necessary in Nos. 509 and 510:

509. **Euphagus carolinus** (MÜLLER).

510. **Euphagus cyanocephalus** (WAGLER).

530*a*. **Astragalinus psaltria hesperophilus** OBERHOLSER.

Green-backed Goldfinch.

Astragalinus psaltria hesperophilus OBERHOLSER, Proc. Biol. Soc. Wash., XVI, Sept. 30, 1903, 116.

GEOG. DIST. — Southwestern United States and northwestern Mexico, from California and Lower California to Utah, Arizona, and extreme southwestern New Mexico.

530*b*. **Astragalinus psaltria mexicanus** (SWAINSON). This is found to be equivalent to *A. psaltria* (*cf.* OBERHOLSER, Proc. Biol. Soc. Wash., XVI, 1903, 115), and should be expunged from the Check-List.

544*b*. **Passerculus rostratus halophilus** (MCGREGOR). This is to be eliminated from the Check-List as equivalent to *P. rostratus guttatus*, in summer plumage. (*Cf.* BREWSTER, Bull. Mus. Comp. Zoöl., XLI, 1902, 139.)

591*d*. **Pipilo fuscus carolæ** MCGREGOR. This alleged form is to be eliminated, as indistinguishable from *P. fuscus crissalis* (*cf.* editorial note, Condor, 1901, 108; and MCGREGOR, Pac. Coast Avifauna, No. 2, 1901, 15).

612*a*. **Petrochelidon lunifrons tachina** OBERHOLSER.

Lesser Cliff Swallow.

Petrochelidon lunifrons tachina OBERHOLSER, Proc. Biol. Soc. Wash., XVI, Feb. 21, 1903, 15.

GEOG. DIST.— Southwestern Texas, south into eastern Mexico to Vera Cruz.

612.2. **Petrochelidon melanogastra** (SWAINSON). Found to be only subspecifically distinct from *P. lunifrons*, hence:

612*b*. **Petrochelidon lunifrons melanogastra** (SWAINSON). (*Cf.* RIDGWAY, Bull. U. S. Nat. Mus., No. 50, pt. III, 51, in press.)

SUBFAMILY **PTILIOGONATINÆ**. This becomes

FAMILY **PTILIOGONATIDÆ**. SILKY FLYCATCHERS. (*Cf.* RIDGWAY, Bull. U. S. Nat. Mus., No. 50, pt. I, 1901, 21.)

622*d*. **Lanius ludovicianus mearnsi** RIDGWAY.

San Clemente Shrike.

Lanius ludovicianus mearnsi RIDGWAY, Proc. Biol. Soc. Wash., XVI, 1903, 108.

GEOG. DIST.—San Clemente Island, California.

622*e*. **Lanius ludovicianus migrans** W. PALMER.

Migrant Shrike.

Lanius ludovicianus migrans W. PALMER, Auk, XV, July, 1898, 248.

GEOG. DIST.— Eastern Canada and eastern United States, west to Minnesota; south to the Carolinas, Tennessee, and lower Mississippi valley. Breeds chiefly in the northern parts of its range, migrating south in winter.

649. **Compsothlypis nigrilora** (COUES). This becomes a subspecies of *C. pitiayumi* (VIEILLOT). (*Cf.* RIDGWAY, Bull. U. S. Nat. Mus., No. 50, pt. II, 1902, 490), viz.:

649. **Compsothlypis pitiayumi nigrilora** (COUES).

658. **Dendroica rara** (WILSON). This becomes

658. **Dendroica cerulea** (WILSON).

Sylvia cerulea WILSON, Amer. Orn., II, 1810, 141, pl. xvii, fig. 5.

The name *rara* was orginally adopted in the Check-List on the assumption that *Sylvia cærulea* Latham was a primary reference; it, however, proves to be merely *Motacilla cærulea* Linnæus, placed in the genus *Sylvia*. As the spirit of the 'Code' (Canon XXXIII) is to ignore cases of this character (*cf.* ALLEN, Auk, 1903, 216), and previous rulings of the Committee have been on these lines, it follows that the name *cerulea* must be restored.

[692.] **Basileuterus culicivorus** (LICHTENSTEIN). Becomes

[692.] **Basileuterus culicivorus brasherii** (GIRAUD).

Brasher's Warbler.

Muscicapa brasierii (err. typ.) GIRAUD, Sixteen Species Texan Birds, 1841, 25, pl. vi, fig. 2.

GEOG. DIST.— Northeastern Mexico. Texas?

B. culicivorus occurs from southern Mexico to Costa Rica. (*Cf.* RIDGWAY, Bull. U. S. Nat. Mus., No. 50, pt. II, 1902, 755.)

696. **Budytes flavus leucostriatus** (HOMEYER). This becomes

696. **Budytes flavus alascensis** RIDGWAY.

Alaskan Yellow Wagtail.

Budytes flavus alascensis RIDGWAY, Proc. Biol. Soc. Wash., XVI, Sept. 30, 1903, 105.

GEOG. DIST.— Western Alaska, in summer, south in winter into eastern Asia.

The true *B. flavus leucostriatus* is confined to the Old World.

SUBFAMILY **MIMINÆ**. THRASHERS, etc. This becomes

FAMILY **MIMIDÆ**. THRASHERS, MOCKINGBIRDS, etc. (*Cf.* RIDGWAY, Bull. U. S. Nat. Mus., No. 50, pt. I, 1901, 23.)

713. **Heleodytes brunneicapillus** (LAFR.). This is replaced by

713. **Heleodytes brunneicapillus couesi** (SHARPE).

Campylorhynchus couesi SHARPE, Catal. Birds Brit. Mus., VI, 1881, 196.

H. brunneicapillus (LAFR.) is restricted to western Mexico (*cf.* MEARNS, Auk, 1902, 142).

725*d*. **Telmatodytes palustris iliacus** RIDGWAY.

Telmatodytes palustris iliacus RIDGWAY, Proc. Biol. Soc. Wash., XVI, Sept. 30, 1903, 110.

GEOG. DIST.— Mississippi Valley and Great Plains region, north to Alberta, east to Indiana, south in migration over the greater part of Mexico (except northwestern portion), and along Gulf coast to western Florida; occasionally to middle and southern Atlantic coast.

725.1. **Telmatodytes marianæ** (SCOTT). Reduction to the rank of a subspecies becomes necessary through intergradation with *T. palustris*:

725*e*. **Telmatodytes palustris marianæ** (SCOTT). (*Cf.* OBERHOLSER, Proc. Biol. Soc. Wash., XVI, 1903, 149.)

SUBFAMILY **SITTINÆ**. NUTHATCHES. This is raised to family rank:

FAMILY **SITTIDÆ**. NUTHATCHES. (*Cf.* RIDGWAY, Bull. U. S. Nat. Mus., No. 50, pt. I, 1901, 22.)

733*c*. **Bæolophus inornatus restrictus** RIDGWAY.

San Francisco Titmouse.

Bæolophus inornatus restrictus RIDGWAY, Proc. Biol. Soc. Wash., XVI, Sept. 30, 1903, 109.

GEOG. DIST.—Vicinity of San Francisco Bay, California.

735*c*. **Parus atricapillus turneri** RIDGWAY.

Turner's Chickadee.

Parus atricapillus turneri RIDGWAY, Proc. Biol. Soc. Wash., II, April 10, 1884, 89.

GEOG. DIST.—Alaska, north and west of Cook Inlet. (*Cf.* HELLMAYR, Tierreich, Lief. 18, 1903, 56.)

SUBFAMILY **CHAMÆINÆ**. This is raised to family rank, to include the single genus *Chamæa* (*cf.* COUES, Key, 1903, 266), and should stand after No. 746*a*, as:

FAMILY **CHAMÆIDÆ**. WREN-TITS.

744.1. **Psaltriparus santaritæ** RIDGWAY. This is found to be equivalent to *P. melanotis lloydi*, and should be eliminated from the Check-List. (*Cf.* OBERHOLSER, Auk, 1903, 199.)

745. **Psaltriparus lloydi** SENNETT. Intergradation has been shown to occur between *lloydi* and *melanotis*, hence the following change becomes necessary:

745. **Psaltriparus melanotis lloydi** (SENNETT).

GENUS **PHYLLOPSEUSTES** MEYER. Becomes

GENUS **ACANTHOPNEUSTE** J. H. BLASIUS.

Acanthopneuste J. H. BLASIUS, Naumannia, 1858, 313. Type, *Phyllopneuste borealis* J. H. BLASIUS. (*Cf.* SHARPE, Hand-List, IV, 1903, 216; OBERHOLSER, Auk, XXI, 1904, 390.) No. 747 thus becomes

747. **Acanthopneuste borealis** (J. H. BLASIUS).

750. **Regulus obscurus** (RIDGWAY). This becomes

749*b*. **Regulus calendula obscurus** RIDGWAY. (*Cf.* HELLMAYR, Tierreich, Lief. 18, 1903, 15.)

II. PROPOSED CHANGES IN NOMENCLATURE AND SPECIES AND SUBSPECIES REJECTED.

9. **Gavia arctica** (LINNÆUS) vs. *G. pacifica* (*cf.* GRANT, Catal. Birds Brit. Mus., XXVI, 1898, 495). Mr. Grant's

inference, from negative evidence, that *G. arctica* does not occur in North America is erroneous, and there is hence no necessity for eliminating No. 9 from the Check-List.

Aythya vs. *Nyroca* (*cf.* HOWE, Suppl. Birds Rhode Island, 1903, 9). No change is necessary here; the reasons offered for the proposed change are insufficient. (*Cf.* 11th Suppl., Auk, XIX, 1902, 332.)

224. **Steganopus tricolor** VIEILLOT vs. *S. glacialis* (*cf.* COUES, Key, 1903, 795). No change is thought to be advisable, as the name *glacialis* is of doubtful application.

GENUS **PHILOHELA** GRAY vs. *Microptera* (*cf.* POCHE, Ornith. Monatsb., 1904, 23). *Microptera* of NUTTALL (1834) is preoccupied by *Micropterus* LESSON (1831), leaving *Philohela* as the earliest available generic name for the American Woodcock.

310. **Meleagris gallopavo merriami** NELSON vs. *M. g. intermedia* (*cf.* GRANT, Ibis, 1902, 235). The Committee has again examined series of Turkeys from Texas, Arizona, and Mexico, and finds no reason for reversing its former decision.

318. **Leptotila fulviventris brachyptera** (SALVADORI) vs. *L. brachyptera* (*cf.* GODMAN, Biologia Centr.-Am., Aves, III, 1902, 259). The two forms are found to intergrade, and no change is required.

328. **Elanus leucurus** (VIEILLOT) vs. *E. glaucus* (BARTON) (*cf.* COUES, Key, 1903, 656). No changes is necessary, as *Falco glaucus* BARTON probably refers to the Marsh Hawk, but is not with certainty identifiable. (*Cf.* 9th Suppl., Auk, XIX, 1899, 131.)

407*a*. **Melanerpes formicivorus angustifrons** BAIRD vs. *M. angustifrons* (*cf.* BREWSTER, Bull. Mus. Comp. Zoöl., XLI,

1902, 105). A trinomial appears best to express the status of this form, although actual intergradation is difficult to prove. No change is deemed desirable at this time.

425. **Aëronautes melanoleucus** vs. *A. saxatilis* (*cf.* COUES, Key, 1903, 557).

The name *saxatilis* was originally rejected on account of insufficiency of description; no change appears to be necessary.

Myiarchus crinitus residuus HOWE, Contr. Amer. Orn., I, 1902, 30. (*Cf.* NELSON, Proc. Biol. Soc. Wash., XVII, 30, March 10, 1994.)

Rejected, as being too close to *M. crinitus*.

Subgenus *Empidias* CABANIS (*cf.* COUES, Key, 1903, 522).

Not considered worthy of recognition.

456. **Sayornis phœbe** (LATHAM) vs. *Empidias phœbe* (*cf.* COUES, Key, 1903, 525). No change is required.

Subgenus *Mitrephanes* COUES (*cf.* COUES, Key, 1903, 532).

Mitrephanes was originally applied to a group of extra-limital species, and Nos. 470 and 470*a* of the Check-List have been erroneously referred to it.

491. **Nucifraga columbiana** (WILSON) vs. *Picicorvus columbianus* (*cf.* COUES, Key, 1903, 490). This case was decided at a former meeting of the Committee, and no further action is considered necessary.

SUBFAMILIES *Sturnellinæ*, *Agelæinæ*, *Icterinæ*, and *Quiscalinæ* (*cf.* COUES, Key, 1903, 464). These proposed subfamilies of the Icteridæ adopted in the 'Key,' seem distinct enough when North American members of the family alone are considered, but they merge into each other through the many intermediate links in tropical America.

Icterus spurius affinis (LAWRENCE) (*cf.* COUES, Key, 1903, 477).

This is considered inseparable from *I. spurius* and not worthy of recognition.

GENUS **ASTRAGALINUS** CABANIS vs. *Acanthis* (*cf.* HARTERT, Vög. Pal. Fauna, 1903, 66). In the opinion of the Committee *Astragalinus* is sufficiently distinct generically from *Acanthis*.

Centronyx, subgenus of *Coturniculus*, vs. *Centronyx*, subgenus of *Passerculus* (*cf.* COUES, Key, 1903, 403). The question of the status of *Centronyx* was carefully considered by the Committee last year (*cf.* Twelfth Supplement, Auk, 1903, 349), and no change appears to be necessary.

GENUS **COTURNICULUS** BONAPARTE vs. *Coturniculus*, subgenus of *Ammodramus* (*cf.* Coues, Key, 1903, 403, 408). The status of *Coturniculus* was also decided at a recent meeting of the Committee (*cf.* Twelfth Supplement, Auk, 1903, 349).

GENUS **OREOSPIZA** RIDGWAY vs. *Chlorura* (*cf.* POCHE, Ornith. Monatsb., 1904, 25–26). There is no necessity for a change, as *Chlorura* Sclater is preoccupied by *Chlorurus* Swainson.

588*d*. **Pipilo maculatus atratus** RIDGWAY vs. *P. m. megalonyx* (*cf.* GRINNELL, Condor, 1902, 23). No change is deemed advisable in this case.

Subgenus *Kieneria* BONAPARTE (*cf.* COUES, Key, 1903, 460). This is used by the late Dr. Coues as a subgenus for the Brown Towhees, but is properly a synonym of the extralimital genus *Melozone*, and as such does not require consideration here.

Genus *Chrysocantor* MAYNARD (*cf.* BANGS, Bull. Mus. Comp. Zoöl., XXXIX, 1903, 153). This is rejected as being based upon color characters alone.

Dendroica æstiva brewsteri GRINNELL, Condor, 1903, 72. Not accepted, the characters ascribed being too slight for recognition in the Check-List.

Heleodytes brunneicapillus anthonyi MEARNS (Auk, 1902, 143). This is considered to be the same as *H. b. couesi* (*cf.* SWARTH, Condor, 1904, 17–19), and is therefore rejected.

Catherpes mexicanus polioptilus OBERHOLSER, Auk, 1903, 197. Rejected, as not sufficiently distinct from *C. mexicanus albifrons*.

GENUS **TROGLODYTES** VIEILLOT vs. *Paulomagus* HOWE (*cf.* HOWE, Suppl. Birds R. I., 1903, 22). *Paulomagus* is proposed as a new generic name for the House Wrens. The Committee has already decided that *Troglodytes* refers to the House Wrens; hence *Paulomagus* is superfluous.

GENUS **OLBIORCHILUS** OBERHOLSER vs. *Anorthura* RENNIE (*cf.* SHARPE, Hand-List, IV, 1903, 91). *Anorthura* is an exact equivalent of *Troglodytes*, embracing the House Wrens only, leaving *Olbiorchilus* as the first name applicable to the Winter Wrens.

Cistothorus palustris dissæptus BANGS, Auk, 1902, 352. This is rejected as being equivalent to *Telmatodytes palustris*. Mr. Bangs distinguished two forms, but through inadvertence renamed *T. palustris*; the other has since been described as *T. p. iliacus*.

Sitta pusilla caniceps BANGS (*cf.* HELLMAYR, Tierreich, Lief. 18, 1903, 190). This was rejected at an earlier meeting of the Committee (*cf.* Ninth Supplement, Auk, 1899, 131).

GENUS **PSALTRIPARUS** BONAPARTE vs. *Ægithalos* HERMANN (*cf.* HELLMAYR, Tierreich, Lief. 18, 1903, 108). These two genera are held by the Committee to be perfectly distinct.

Auriparus vs. *Anthoscopus* (*cf.* HELLMAYR, Tierreich, Lief. 18, 1903, 125). No change seems warranted.

Subgenus *Phyllobasileus* CABANIS (*cf.* COUES, Key, 1903, 262). This is not considered sufficiently distinct from *Regulus* to be recognized in the Check-List.

GENUS **Ixoreus** BONAPARTE vs. *Hesperocichla* BAIRD (*cf.* SCLATER, Ibis, 1903, 142). No change in this case is considered necessary. While Bonaparte may have mistaken a South American species of *Tœnioptera* for *Turdus nævius* Gmelin, he distinctly states his new genus *Ixoreus* to be based upon "*Turdus nævius*, Gm."

THE FARALLONES (EXCEPT SADDLE ROCK), FROM THE EAST.